EDC Education Development Center

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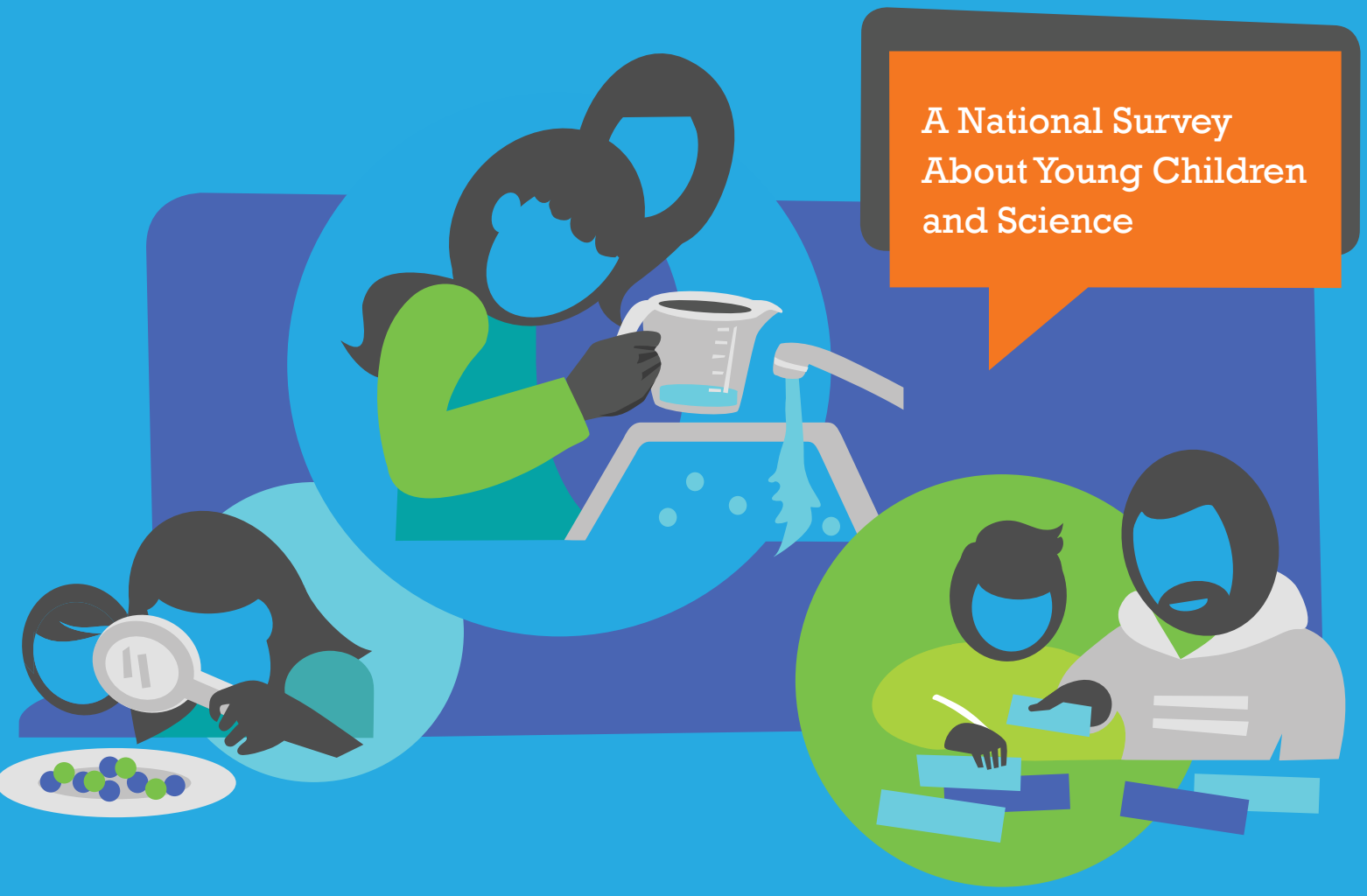
What Parents Talk About When They Talk About Learning



Ready To Learn **Research**

March 2018

About EDC

Education Development Center (EDC) is a global nonprofit that advances lasting solutions to improve education, promote health, and expand economic opportunity. Since 1958, we have been a leader in designing, implementing, and evaluating powerful and innovative programs in more than 80 countries around the world.

About SRI

SRI Education, a division of SRI International headquartered in Menlo Park, California, is tackling the most complex issues in education and learning to help students succeed. We work with federal and state agencies, school districts, major foundations, nonprofit organizations, and international and commercial clients to address risk factors that impede learning, assess learning gains, and use technology for educational innovation.

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About The Ready To Learn Initiative

The Ready To Learn Initiative is a cooperative agreement funded and managed by the U.S. Department of Education's Office of Innovation and Improvement. It supports the development of innovative educational television and digital media targeted to preschool and early elementary school children and their families. Its general goal is to promote early learning and school readiness, with a particular interest in reaching low-income children. In addition to creating television and other media products, the program supports activities intended to promote national distribution of the programming, effective educational uses of the programming, community-based outreach and research on educational effectiveness.

The contents of this research report were developed under a grant from the Department of Education. However, those contents do not necessarily represent the policy of the Department of Education, and you should not assume endorsement by the Federal Government. [PR/Award No. U295A150003, CFDA No. 84.295A]

Design: EDC Digital Design Group
Photography: Burt Granofsky, EDC

Suggested citation:
Silander, M., Grindal, T., Hupert, N., Garcia, E., Anderson, K., Vahey, P. & Pasnik, S. (2018). *What Parents Talk About When They Talk About Learning: A National Survey About Young Children and Science*. New York, NY, & Menlo Park, CA: Education Development Center, Inc., & SRI International.

Contents

Introduction

Young children are naturally curious about the world around them. They mix water and dirt to create mud, ask whether plants eat food like people do, follow ants marching along a sidewalk crack, and wonder about everything they see.

With help from adults, these early experiences are key to developing the important thinking and reasoning skills that children will later use to explore increasingly complex questions about how the world works (Bustamante, White, & Greenfield, 2017; French, 2004; Kuhn, 2011; Nayfeld, Fuccillo, & Greenfield, 2013; Peterson & French, 2008; Wright & Neumann, 2014). Science exploration and investigation help children develop language, literacy, and thinking skills necessary for them to become adults who can reason logically and solve problems, think creatively, and collaborate and communicate with others.

Previous research has identified parental involvement—the ways parents and other caring adults interact with children in and outside of the home, and the kinds of learning materials with which parents surround children—as key to helping children develop knowledge and skills in literacy and math (Bassok, Finch, Lee, Reardon, & Waldfogel, 2016; Burgess, Hecht, & Lonigan, 2002; Niklas, Nguyen, Cloney, Tayler, & Adams, 2016; Sénéchal & LeFevre, 2002; Skwarchuk, Sowinski, & LeFevre, 2014). Parental support may be critical to children's developing knowledge and understanding in science as well.

This study used a nationally representative parent survey, combined with in-depth interviews and home visits with a smaller sample of families, to learn how parents of young children, particularly low-income parents, encourage and take part in their children's learning, especially their science learning. This study also investigated parent perceptions and reported use of science-related educational media, such as television shows, videos, online games, and mobile apps.

Key Takeaways

Parent responses to the survey suggest that most parents are working to help their children learn, and that this is true of parents across all levels of income and education. Many parents say that it is important for them to help their children learn a range of skills, including behavioral and academic skills, and nine out of ten report doing learning activities with their children daily. Further, most parents feel confident about their abilities to help their young children with behavior and social skills, as well as with math and literacy learning.

Parents do not hold the same views about science learning, however. Many feel it is more important for them to help their children learn other skills, and parents are less likely to be confident about helping their children learn science than these other subjects. Findings from our qualitative study suggest that parents feel they do not know enough science themselves, and often do not know how to answer their children's questions about complex scientific ideas in a way that their young child can understand. These concerns suggest that many parents seemed to believe that key to helping their children learn science was providing factually correct answers to questions, and that they did not seem to be aware of the importance and the power of noticing, talking about, and exploring the things that children wonder about and experience in their everyday lives.

While nearly half of all parents reported doing science daily, half of parents do science less often with their children, and many parents, especially low-income parents, say that more resources would help them to do more science with their children. Surveyed parents were most likely to report that access to easy-to-do ideas for science activities, especially ones that are specifically for young children and ones that use everyday materials, would help. In this context, science-related media can play a substantial role in engaging both parents and children in science learning. Many parents say their children access science-related media—particularly television shows and online videos—weekly or more often. Evidence of the positive impacts that media-based interventions can have on young children's learning in math and literacy (Clements & Sarama, 2008; Linebarger & Piotrowski, 2009; Neuman, Newman, & Dwyer, 2011) suggests that science media has the potential to help children and parents build science knowledge and to show parents how to help support children's explorations in ways that promote thinking and conceptual understanding. For example, media can help parents understand what science is and why it is important. Media also can model what doing science looks like for young children and their adults, and how parents can enrich and extend their children's experiences in ways that promote science exploration and thinking, children's confidence about their abilities to do science, and children's perceptions of themselves as scientists.

Parent responses to the survey suggest that science-based media has not yet met this potential, however. For example, few surveyed parents think their children are learning a lot of science from media. Parents in focus groups and home visits suggested that the media content was not appropriate to support young children's learning, or they did not recognize the content of some media as being about science.

Early Science as a Foundation for Reasoning and Solving Problems in Adulthood

Children as young as preschool age are able to engage in scientific thinking. For example, young children are capable of developing and testing hypotheses, asking questions, generating explanations, using models, predicting, and revising predictions based on observations (Gerde, Schachter, & Wasik, 2013; National Research Council, 2012). Involving children in experiences that allow them to engage in scientific thinking from a young age allows them not only to build science skills and knowledge but also to develop thinking and reasoning skills that are broadly applicable across many situations. By engaging in science, children are using language as they reason about their experiences, math to measure and developing their executive functioning and persistence skills (Bustamante, White, & Greenfield, 2017; French, 2004; Kuhn, 2011; Nayfeld, Fuccillo, & Greenfield, 2013; Peterson & French, 2008; Wright & Neumann, 2014). Engagement in science should start early—research suggests that children who have high levels of science knowledge in kindergarten are likely to be high science achievers at later stages of schooling, and vice versa (Morgan, Farkas, Hillemeier, & Maczuga, 2016).

Better Early Learning and Early Science Learning with Parental Supports

Research indicates that parental involvement is critical in helping children develop early literacy and mathematics skills so that they can be ready for school (e.g., Bassok, Finch, Lee, Reardon, & Waldfogel, 2016; Burgess, Hecht, & Lonigan, 2002; Niklas, Nguyen, Cloney, Tayler, & Adams, 2016; Sénéchal & LeFevre, 2002; Skwarchuk, Sowinski, & LeFevre, 2014). Parental supports for learning need not be special events; essential cogntive supports are embedded in everyday interactions. Conversations between parents and children are extremely valuable as they promote the sharing of ideas, and allow parents to use complex language and a wide variety of vocabulary, asking "what," "where," and "why" questions and leaving room for children to think, reason, and respond. Providing learning materials such as books and regularly reading together are also important parental supports for children's cognitive development (National Academies of Sciences, Engineering, and Medicine, 2016).

Having these kinds of interactions and experiences with parents around science may be a key component to success in science learning in school. Moreover, out-of-school learning may be more critical in early science, because many early education programs do not address science (Blank, 2013).

Nurturing young children's scientific exploration in developmentally appropriate ways may not come naturally for all parents, but there is evidence that simple supports can help to increase parents' confidence and efficacy (Benjamin, Haden, & Wilkerson, 2010; Haden et al., 2014). And when parents receive help to improve their involvement in learning, children's school readiness also benefits (Brooks-Gunn & Markman, 2005; Vandermaas-Peeler, Massey, & Kendall, 2016).

Helping Children Living in Poverty Catch Up

Despite all children's natural proclivities to explore the world around them, kindergarten students living in poverty display less knowledge about the natural world than do children from more affluent families. This gap in science-related knowledge persists and widens as children reach high school (Morgan, Farkas, Hillemeier, & Maczuga, 2016). Over the past decade, poverty and income disparity have grown (DeNavas-Walt & Proctor, 2014), creating a greater need to ensure that disadvantaged children enter school primed to learn science by their experiences

at home. Moreover, some research suggests that the income-based science achievement gap is wider than income-based math and literacy achievement gaps (Curran, 2017).

Role of Educational Media

Digital media resources—television shows, films, games, mobile apps, and more—hold potential for encouraging parents to help their children learn science. Media are ubiquitous in most families with young children; children under age eight years are exposed to more than two hours of screen time a day, on average (Rideout, 2017), and many parents report co-using media with their children (Connell, Lauricella, & Wartella, 2015). Certain kinds of media experiences can promote young children's science learning (Mares & Pan, 2013; National Research Council, 2009). Media also can model scientific ways of thinking and talking (Troseth, Saylor, & Archer, 2006). Moreover, media that can be accessed at little or no cost can be important learning resources, particularly in lower-income families where other learning resources may be more scarce.

Digital media resources also can provide important supports for parental involvement in science learning—for example, by providing guidance for parents on how to ask questions and provide feedback to children (Crawley et al., 2002). When parents get involved in their child's learning using digital media, not only does the child learn but the parent learns as well, in a process known as co-learning (Clark, 2011; Pasnik, S., Moorthy, S., Llorente, C., & Hupert, N, 2015; Strouse, O'Doherty, & Troseth, 2013; Rasmussen et al., 2016).

Ready To Learn

For over a decade, United States policymakers have prioritized increasing student achievement in science as critical to U.S. innovation and economic competitiveness (America COMPETES Act, 2007; Gordon, 2007; Secretary's Proposed Supplemental Priorities and Definitions for Discretionary Grant Programs, 2017; U.S. Department of Education, 2015). Family engagement with early science learning is a key component to helping stoke the future question-asking and problem-solving skills that lead to innovation and to ensuring that every child enters school excited about learning and poised to succeed, and media may be a particularly powerful tool to engage families in this endeavor. While many national studies have examined families' use of media for learning (e.g. Rideout, 2017; Rideout & Katz, 2016; Wartella, Rideout, Lauricella, & Connell,2014) and family engagement in literacy and mathematics (e.g. the ECLS-K:2011 survey; NCES, 2011), no research has examined national patterns in family engagement in science with their young children, nor their use of science-related media.

Researchers at Education Development Center, Inc. (EDC) and SRI International conducted this study as part of the Ready To Learn Initiative. The Initiative brings free educational television and digital media resources to children ages 2–8, promoting early learning and school readiness, with an emphasis on supporting children from low-income, underserved communities. Developing a deeper understanding of how national media and the network of local public media stations can support family learning at scale drives the CPB-PBS Ready To Learn Initiative. By connecting perceptions of early learning and science learning to the kinds of media and other educational resources families use in and outside of the home, the results of this study will inform the development of public media resources to help parents and children learn together. In addition, these findings will add to the growing understanding of how parents perceive their own role in their child's learning experiences, and how educators and informal caregivers can support parents and children as they learn and grow.

Overview

What this Study Found

- Nearly all parents, regardless of income or education level, think it is important to help their young children learn, especially social skills, literacy, and mathematics.
- Most parents say they are confident about their ability to teach their young children literacy, math, and social skills. Fewer parents are confident about science. Parents with less formal education are less likely to feel confident in helping their children learn than are parents with more education.
- Nine out of ten parents report doing learning activities with their children daily. About half of parents report doing science-related activities with their children daily.
- To do more science, parents want ideas and resources to build their knowledge and confidence for helping their children learn science. Seven of 10 parents say that knowing what young children need to learn about science, and having ideas for doing science with everyday materials, would help them do a lot more science.
- Many families say they use science media weekly or more—particularly videos or TV shows about science. Slightly more than half of parents are satisfied with science learning media resources, but most do not think these resources have helped their child learn a lot of science.
- Parents may be missing opportunities to deepen the impacts of these experiences. Parents report monitoring media use and watching alongside their children but are less likely to draw connections between media and families' daily lives.

About This Study

The purpose of this study is to provide new insights about the ways in which parents help their young children learn. The study builds on prior research that has examined parents' support for literacy and mathematics learning (e.g., Bassok et al., 2016; O'Donnell & Mulligan, 2008), to provide new information on parents' beliefs and practices related to early science learning and use of learning media.

We examine four questions:

1. **How do parents and caregivers help their young children learn in general?**
2. **How do parents and caregivers help their young children learn science?**
3. **How do parents describe their children's use of educational media?**
4. **How do interactions that support early learning differ among families?**

A Note About Terminology

Parent and Young Children. We use the term "parent" in a broad sense, as our sample includes guardians as well as parents. We use the term "young children" throughout this report to refer to children between the ages of three and six years old.

Science. We chose not to define science in our survey for parents. Instead, we collected information about how parents interpret the word science, and allowed this definition to guide parents' responses. More information about how parents defined science is available on page 9.

Television and Digital Media. We refer to "media" and "digital media" in this report multiple times. We view media as resources that are available via television, computer, video, smart device (phone, tablet), app, or other electronic means. In some cases, these media may be games or videos; in others, they may be directions or other information that parents and children can download and use as print documents to guide activities or provide information.

Methods

Two complementary studies inform this report: a nationally representative telephone survey of parents of three- to six-year-old children, and an in-depth qualitative study with a smaller sample of parents, based on focus groups, interviews, and home visits, all conducted from August–December, 2017.

National Survey

Data for this study came from a telephone (cell-phone and landline) survey, conducted between August 31 and October 8, 2017, of a nationally representative sample of 1,442 parents with at least one three- to six-year-old child living at home. The survey was developed and piloted by researchers at EDC and SRI and conducted by SSRS, a survey and market research firm. The survey study oversampled low-income parents to suit the focus of the study on these families' perspectives and experiences in particular—909 of 1,442 families (63%) had an annual household income of $50,000 or less.[1]

The survey asked parents about their attitudes, beliefs, and practices related to early learning, science learning, and digital media use. It also asked parents about their sense of responsibility and confidence in helping their children learn outside of school, what skills and knowledge they feel are important for their young children to learn, the kinds of learning activities that they do with them, and how the family uses learning-related digital media.

In addition to describing patterns across all families surveyed, we examined whether each finding about parents' attitudes and practices differs across parent education levels, household income, parent and child gender, and whether living in an urban, suburban, or rural location. We report significant differences across subgroups, as well as provide further discussion for some findings where we observed notable variations or similarities across subgroups; however, we found no clear patterns in differences by child gender and urbanicity, and thus do not discuss those in this report.[2]

Qualitative Study

The qualitative study sought to illuminate parents' survey responses by gathering rich, descriptive data around families' interactions and everyday learning experiences. It also sought to extend the survey findings in a few key ways. First, it focused solely on low-income families, and so sheds light especially on those parents' perspectives, experiences, and

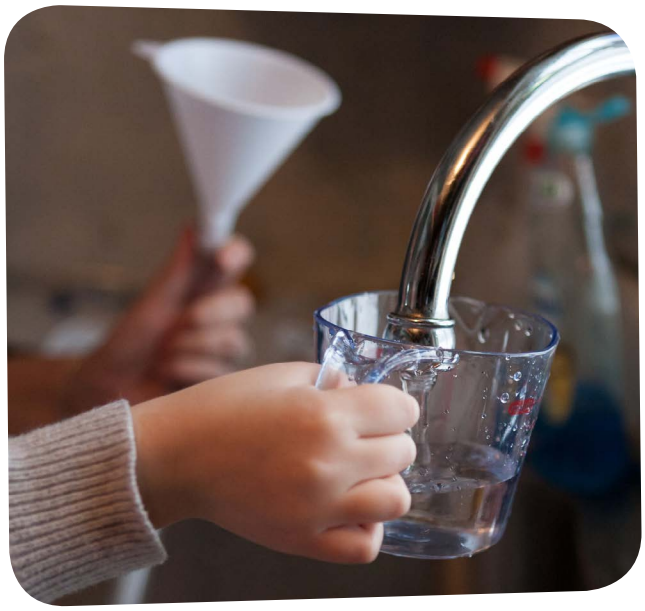
[1] The margin of sampling error for this study in total is +/-3.5 percentage points at a 95% confidence level. The survey used a prescreened, nationally representative, random, digital-dial dual-frame (cellular and landline) sample. The sample consisted of respondents who had been reached via dual-frame RDD sampling using a prior omnibus survey. This respondent sample was stratified by income, and researchers oversampled low-income parents (i.e., household income of $50,000 or less, n=909). Households who were identified as meeting the parental and income qualification criteria (both on landlines and cell phones) were recontacted and rescreened for this study. Specifically, researchers recontacted households from this sample who met parental and income requirements. Potential respondents were contacted via telephone, and those eligible to participate were offered a $5 financial incentive to complete the 25-minute survey. Toward the end of the field period (September 29, 2017), the incentive was increased to $10 in order to foster participation of harder-to-reach respondents. A total of 187 respondents were offered the $10 incentive. Eligible respondents who chose to participate were asked a series of questions about their beliefs and practices regarding early learning. All survey interviews were completed through the CfMC 8.6 Computer Assisted Telephone Interviewing (CATI) software system. Data were analyzed using weights that account for probability of sampling. See technical appendix (Appendix A, page 56) for more information regarding weighting procedures.

[2] Subgroup differences are reported only when $p < .05$ in regression analyses.

needs in helping their children learn. Second, it delved more deeply into parents' thinking and rationale, how and why they help their children learn, and the kinds of supports they need to do so.

To gain a deeper understanding of how and why parents help their young children learn, researchers recruited families from a rural location in the south-east, an urban location in the central south and a suburban location in the midwest. Data collection included eight focus groups (with 8–12 families per group) across three sites (a total of 65 parents of three- to six-year-old children), and home visits with 11 families over the course of a month. Two focus groups and one home visit were conducted in Spanish, the rest in English. Focus group participants were recruited by researchers in one site through a local Head Start early learning program,[3] and with the help of local public media station staff in two other sites. Study participants were screened to ensure they met the study criteria (i.e., one child aged 3–6 living at home, annual household income of $50,000 or less). Home visit participants opted in to a visit and then were selected by researchers to ensure variability across the sample in terms of comfort with science and use of digital media for learning. Families were asked to document typical science learning activities that they engaged in between the first and second home visits by texting or emailing pictures, videos, and/or short messages to researchers.

Qualitative data collection addressed parents' ideas about the skills and learning domains they believe are most important to help their young children learn at home; learning activities they do with their children; challenges they face in regards to their children's learning; and educational digital media they and their children use regularly. Researchers also explored, with home visit families, science learning and digital media use, and conducted an observation of families engaging with a short, researcher-provided video and iPad game.



Working from transcriptions and summaries of each data collection event, researchers created a data matrix that provided a preliminary view of the responses. The team then developed a coding scheme through an iterative process that began with constructing a set of base codes grounded in prior similar research studies, then using these codes during an initial review of data. Through this process new codes were identified and constructed to appropriately represent the core themes noted in the data. Once this development process was complete, researchers coded all focus group and home visit interview transcripts. Coded excerpts provided evidence of noted themes and representative quotes. See Appendix A, page 56, for more details about study methods.

[3] Head Start is a program of the U.S. Department of Health and Human Service's Administration of Children and Families. For more information, see https://www.acf.hhs.gov/ohs/about.

How Parents Define Science

By conducting parent focus groups in three different areas of the country, we sought to hear what parents think about when asked about children doing science. It was our intention to give parents the freedom to define science in a way that made sense to them, rather than imposing a set definition of science when asking about their own and their child's actions and thinking.

Parents talked about their children's curiosity and questioning, particularly during everyday routines such as taking the bus, walking to school, or going to the doctor. Children ask their parents about everything they see—the sky, birds, trees, seasonal changes, the moon, the sun. Some parents' top-of-mind descriptions involved children doing science in relation to special projects, such as making "volcanoes," mixing colors, making "slime," or trying something out to "see what happens," such as planting a seed and watching what comes up or leaving food out to see if mold grows on it.

Some parents responded that nothing came to mind about science, that they did not like science, that their children were too young to do science, or that they did not know if what their children did would be considered science. In these instances parents talked about science as difficult or confusing.

Finding

Parents **feel responsible** for their children's learning, especially social skills, literacy, and mathematics.

Highlights

- Nearly all parents, regardless of income or education, think it is important to help their children learn social skills, reading and writing, and mathematics at home.
- Most parents feel they bear the most responsibility for helping their children learn social skills such as sharing and being patient.
- Most parents see themselves as having just as much responsibility as their children's school in helping their children learn early academic content and skills, such as reading, writing, and mathematics.
- Although many parents believe science to be as important as other subjects to learn at home, close to half of parents say other skills, such as reading and social skills, are more important than science for children to learn at home.
- Parents' perceptions differ as to the role they have in helping their children learn: Parents with lower levels of education or income are more likely to report having less of a role than do schools.

Attitudes

Parents' beliefs about whether, and how, to help their young children learn are important precursors to the kinds of learning activities that families engage in together (NASEM, 2016). To gain a better understanding of the rationale that might underlie how parents support children's early learning, the survey asked parents a series of questions about the role they felt they play and skills that are important for their young child to learn at home.

99% of parents

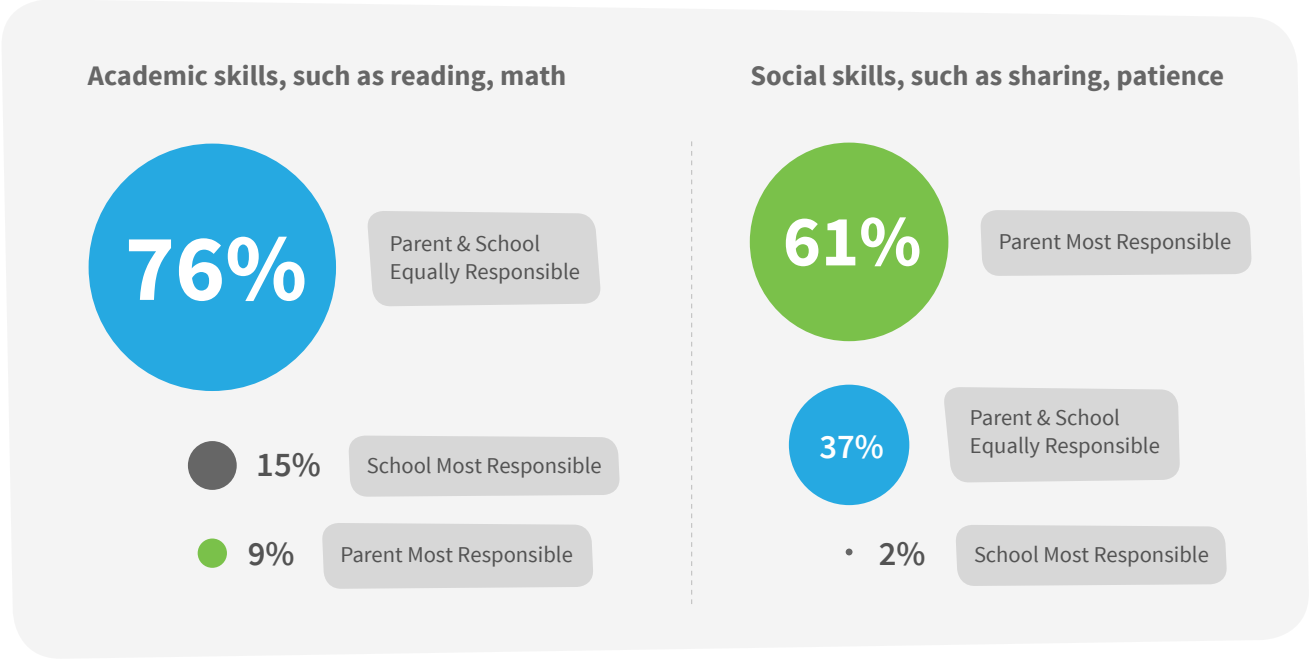
Parents see themselves as playing an important role in their children's education.

Nearly all parents who participated in the survey reported they would like to have a role in supporting their young children's learning. Ninety-nine percent of parents either agreed or strongly agreed with the statement, "You want to be involved in your child's education." Most parents (85%) reported that they did not think that their children will learn everything they need to know in school.

A majority of parents indicated they are most responsible for teaching their children social skills, and that they share responsibility with schools for teaching their children early academic skills.

A large majority of parents reported that they think it is very important for them to help their children learn social skills (93%), reading and writing (83%), or mathematics (77%). More than three-quarters of parents reported that responsibility for helping children learn academic skills, such as reading, writing, and mathematics, is shared equally between parents and schools, while a majority of parents reported that they had primary responsibility for teaching their child social skills (Exhibit 1).

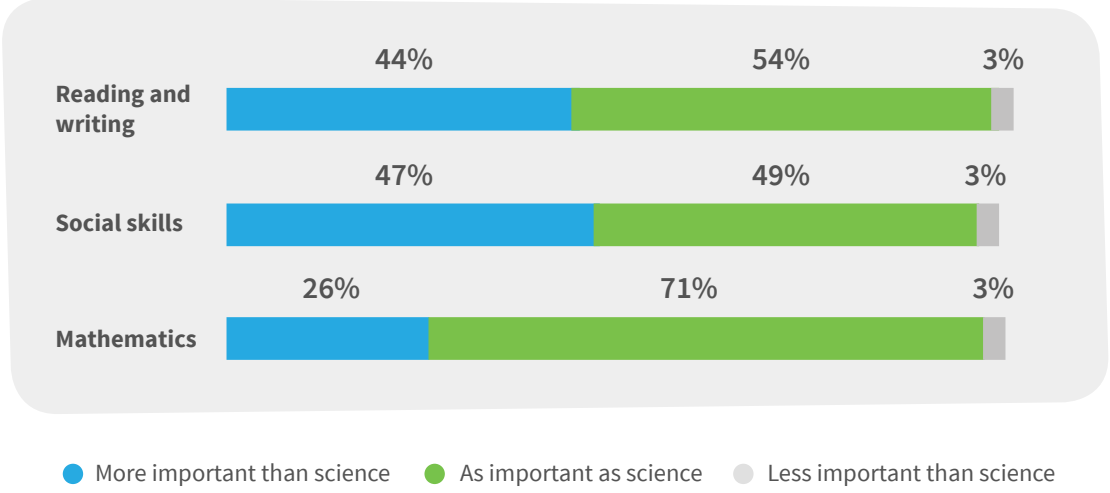
Exhibit 1. Parent Reports Regarding Responsibilities for Teaching Their Child



Although many parents state that science is as important as other subjects to learn at home, nearly half see other subjects, such as social skills and literacy, as more important than science to learn at home.

The survey asked parents to indicate the relative importance of helping their child learn science compared to other kinds of skills and knowledge. Although a plurality of parents reported that helping their children learn science is as important as helping them learn reading and writing, mathematics, and social skills, a substantial proportion of parents reported that helping their children learn in these other areas was more important than helping them learn in science.

Exhibit 2. Parents' Perceptions of the Importance of Helping Children to Learn Science at Home, Compared to Other Skills and Knowledge



Parents emphasize manners, respect, reading, and math.

Findings from the qualitative study echo these survey findings. Parents in focus groups and interviews first cited social and behavioral skills as important to help their children learn, specifically "respect," "manners," and how to focus or be patient.

"I think modeling manners and kindness and stuff like that—that they learn a lot just by watching your behavior and how you handle yourself in stressful situations […]. They're going to mirror you in how you show your feelings."

"I think respect begins at home, because they're always at home, they only spend some of their time at school, right?"

Parents also talked about the importance of helping children learn academic skills, but focused on reading and math. Parents' rationale for focusing on these skills at home related to both the kinds of things they felt their children would need to know for life, as well as what they thought their children would need to know to do well in school.

"I would say reading, math. Because, that stuff, they're going to use in everyday life, you know? You count, no matter what […] math plays a complete part in everyday living, and their reading, too."

"It's also very important for children to learn how to spell their name, what letters are, what numbers are. That's one idea. Also, the teachers have told us that we have to teach them the letters at home as well, so that they go to school and already know what we taught them at home"

Parents often connected their opinions about how to help their young children learn to their own early learning experiences, which served as a model for the content and skills they taught their child, the manner in which they taught them, and the resources they used. This connection was true for both early learning overall and for science learning.

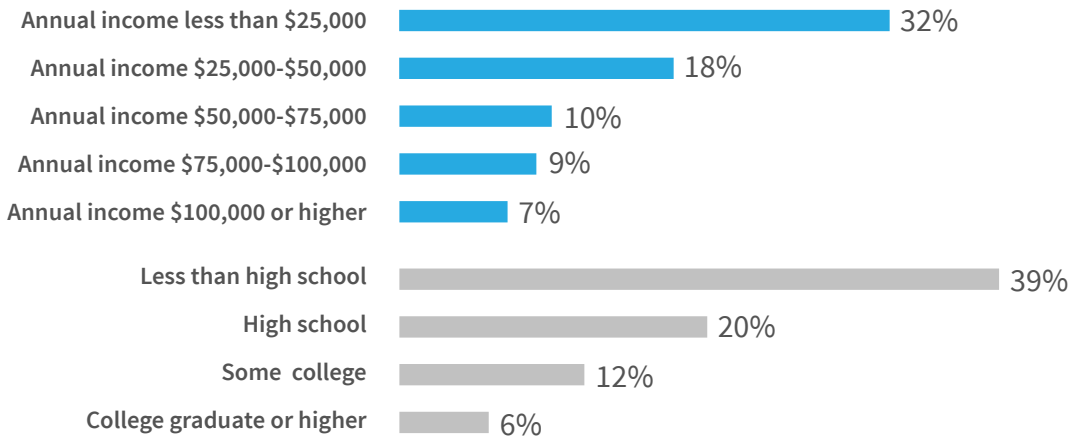
Parents rarely cited science learning as important to do at home, unless prompted by researchers. Some families may be taking cues from local schools. In focus groups and interviews, families shared the view that their young children do not learn science in daycare or school. Parents at one site shared the impression during a focus group that their schools focus mainly on math and language arts instruction so they can improve students' test scores. One mother observed that she didn't think her 5-year-old son ever had science at school because he never talked about it:

> *…[science] is not being taught enough. I truly believe that, because … he's only five and he's good with math, so they've got to be teaching it for him to be as good as he is. The spelling, they've got to be teaching it, but he never comes home and talk about anything pertaining to science. So I'm assuming that they're not teaching it, so maybe it needs to be taught more."*

Parent beliefs about their role in helping their young children learn differ, depending on their income or education in some cases.

Survey findings indicate that parents with lower incomes and parents with lower levels of education both reported that they see less of a role for themselves in supporting their children's learning than do parents with higher incomes and higher levels of education. For example, 32% of families who earned $25,000 per year or less reported believing that their children would learn everything they need to know in school, compared to only 7% of parents who earned $100,000 per year of more. We observe similar differences based on parents' level of education: 39% of parents with less than a high-school education, compared to 6% of parents with a college degree, reported that school would provide their children with everything they needed to learn.

Exhibit 3. Percent of parents who agree or strongly agree that their child will learn everything they need to know in school, by income and education



Finding

Most parents are **confident** about their ability to teach their young children literacy, math, and social skills. Fewer parents are confident about science.

Highlights

- Seven out of 10 parents are "very confident" in their ability to support core school readiness skills: reading and writing, mathematics, and social and behavioral skills.
- Five out of 10 parents feel "very confident" in their ability to support their children's science learning.
- Parents with less education are less likely to be confident about their ability to support their children's learning than are parents with more education.

Confidence

The ways in which parents help their children learn depend in part on parents' perceptions of how capable they are of doing so (Ardelt & Eccles, 2001; Jones & Prinz, 2005). Even if parents think that a specific kind of knowledge or skill is important for their child to learn, if they doubt their ability to help their child with this kind of understanding, parental supports might be minimal. When parents feel confident about their abilities, they are more likely to provide their child with effective supports (Jones & Prinz 2005). Moreover, understanding parents' confidence and lack of confidence related to learning can help identify specific supports that parents need. To better understand potential barriers to parenting practices around learning, the survey asked parents to report how confident they felt about their ability to help their children learn a variety of skills and knowledge important for school readiness.

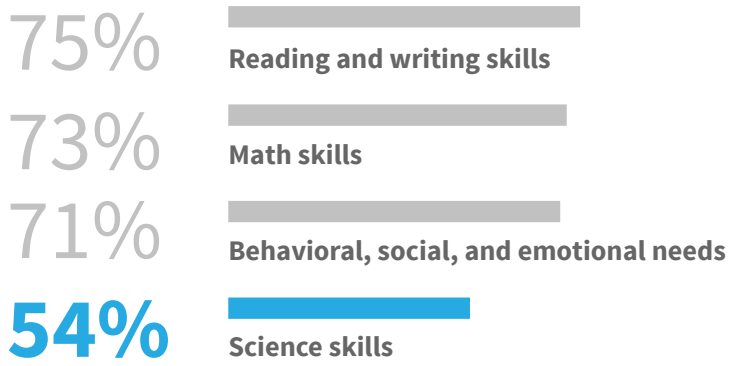
Most parents reported being very confident in their ability to help their children learn reading, mathematics, or social skills.

Survey findings indicate around three-quarters of parents reported feeling very confident in their ability to teach their children reading and writing skills, mathematics skills, and social and behavior skills (see Exhibit 4).

Fewer parents reported feeling very confident in their ability to help their children learn science.

In contrast, only around half of parents reported that they were very confident in their ability to help their children learn science.

Exhibit 4. Percentage of Parents Who Feel "Very Confident" in Their Ability to Help Their Children Learn Age-Appropriate Skills



Many parents connected their lack of confidence about helping their children learn to school expectations or to their own lack of content knowledge.

Findings from the in-depth qualitative study with families provide insight into why some parents lacked confidence helping their child learn, and how this differed by subject. Although discussions were focused on three- to six-year-old children, parents generally gauged their ability to help their child learn math and literacy in terms of school-related expectations. Parents described feeling disoriented by differences in what is taught in schools now, and how it is taught, compared to when they were in school. Because they did not learn these skills, or did not learn in the way their children are now taught in school, they are uncertain how to help their child. In a focus group, one parent described her challenges as, "It's all different. And then they got coding [….] – back then, we didn't have coding." Many parents stated that helping their child with math was particularly challenging because the ways that children learn math at school now differs from how they were taught. Further, some parents' sense of their own limitations can make them feel less able to help their child. One parent felt she did not have enough formal education to be able to help her child learn as well as she would like. Another parent talked about dreading having to read, and so dreaded helping her son learn to read.

> ***"I've never liked reading, and I hate when he's got some work that's got to be read. I really hate it. Of course, he can't just read yet. You know, he can read a little bit, but that's the hardest part for me, because I hate reading. I really do. It's like—it just puts me to sleep. For real, I've never been able to get into reading. I can read, but I just—I've never been into it. Like when they're doing the book fairs and things, these reading things, I'd be hating that time of the year, because I don't want to read the book either. That's the hardest for me."***

Some native Spanish-speaking parents described their lack of fluency in English as a problem in helping their children learn, and some reported being motivated to learn English to keep up with their children's growing fluency. "What I don't want is for my son to ask me and not know how to respond to him. It's embarrassing for me."

Parents' lack of confidence about science seems to be related to a lack of science knowledge as well as to a concern about how to answer their children's complex questions in developmentally appropriate ways.

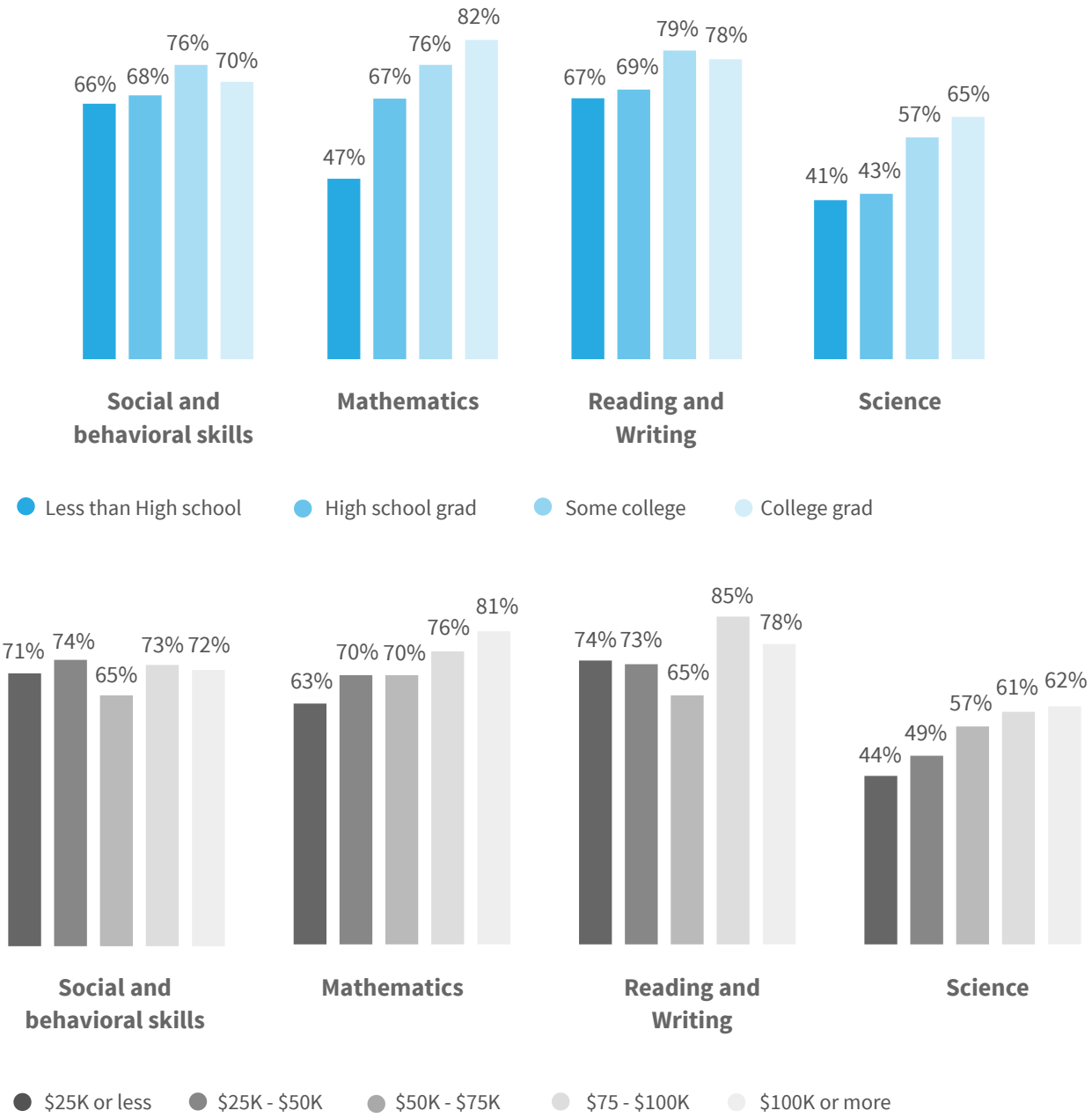
In interviews and focus groups, several parents attributed their low confidence in helping their children learn science to not being able to answer their children's spontaneous questions, such as why leaves change colors. Even when parents knew the answer to their children's scientific questions, some struggled to frame their answers in developmentally appropriate ways. They also reported feeling challenged by questions about death and human reproduction, as well as by more innocuous questions with complex answers such as "Do trees breathe?" One parent stated, "Like, I have common sense, but I just don't know how to get it and break it down to her most of the time".

Parents with lower levels of education are less likely to be very confident in their ability to support their child's mathematics and science learning at home than are parents with higher levels of education.

Parents with lower levels of education were less likely than parents with more education to report that they were very confident in their ability to help their child learn science, and generally reported lower confidence in their ability to support their child's science learning as compared to other domains of learning. Similarly, low-income parents were less likely than wealthier parents to say they were very confident about their ability to help their child learn science however, differences in confidence by income appear to be driven by education. Once we account for parent education, differences in confidence between low- and high-income parents are no longer apparent.

Although we observe a similar pattern regarding parents' confidence in helping their children learn mathematics, it is notable that we did not observe consistent parent income- or education-related differences in the percentages of parents who report feeling very confident in their ability to help their child learn social skills in the home.

Exhibit 5. **Percentage of Parents Who Reported Being "Very Confident" in Their Ability to Help Their Child Learn Various Types of Age-Appropriate Skills, by Parent Education and Annual Family Income**

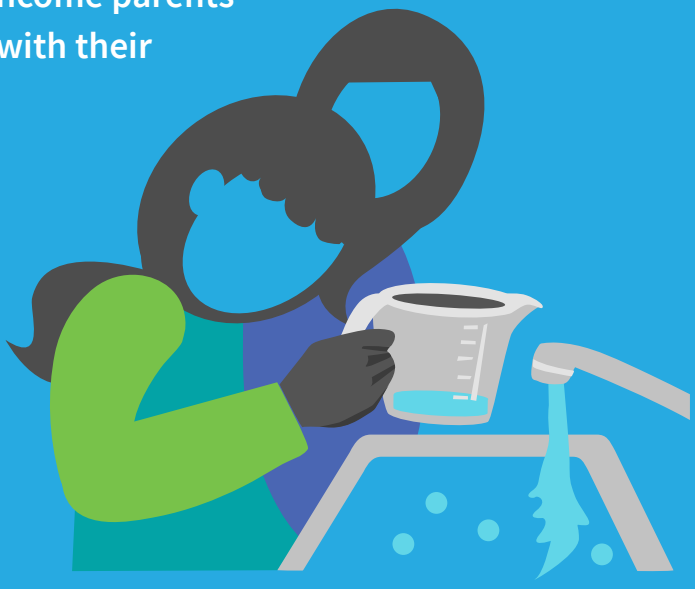


Finding

Parents help their children **learn daily**; some of these activities are about science.

Highlights

- Nearly all parents say they do daily activities that support learning with their children.
- Approximately 2 out of 3 parents report reading books with their children every day. Slightly fewer than 2 out of 3 parents report doing chores with their children daily.
- About half of parents report doing science-related activities with their children daily—most commonly, exploring science outdoors and exploring science in everyday activities.
- While parent reports of general learning activities did not differ by income, fewer of the highest-income parents report doing science-related activities with their children daily.



Learning Activities

The survey asked parents about the kinds of learning activities they do with their children. In order to capture the many kinds of learning that parents might support, the survey included a broad variety of activities, from literacy and math activities to more informal activities that offer opportunities for learning, such as telling stories or helping with daily chores (an activity that might support language development, motor skills, or behavioral and socio-emotional skills). To develop a fuller understanding of science learning in particular, the survey asked parents more detailed questions about some specific kinds of science activities they engage in with their children.

Almost all parents say they engage their children in daily activities that support learning.

Nearly all surveyed parents reported engaging with their children in at least one learning activity every day (Exhibit 6); the most frequently reported activities were book reading and household chores.

In the qualitative study, many parents similarly describe reading every day or every other day with their children—some parents talked about reading not only books but "anything you can get your hands on," including "the cereal box" and signs.

One parent described labeling things around the home to help with vocabulary and reading skills:

> ***"If you go in my house, you see different little words taped everywhere. Refrigerator, I even got the word 'wall' written on the wall. [….]So every time he comes home, he'll twist the door, he'll say, 'Mommy, door,' and stuff like that."***

Some families reported frequent trips to the library—during one home visit, a 5-year-old boy proudly showed researchers a stack of library books—while others went rarely. Most parents in the qualitative study described teaching their kids a variety of different skills. Literacy was a primary focus for many, but parents made it clear that they also tried to help with behavior, math, science, and history. For example, a few parents in the in-depth study described cooking to help reinforce math concepts with their children, and some parents noticed that their children liked to play mathematics or counting games. However, these skills came up far less frequently than literacy when parents described the common learning activities in their home.

In the initial focus groups in the qualitative study, many parents discussed manners, respect, and other social behaviors as a key part of the learning that is important for them to support at home. However, few parents referenced teaching these social behaviors without prompting from the researchers, perhaps because parents did not consider supporting social behavior as a learning activity because it was not a structured or scheduled activity, but rather embedded in their day-to-day lives.

As one parent stated:

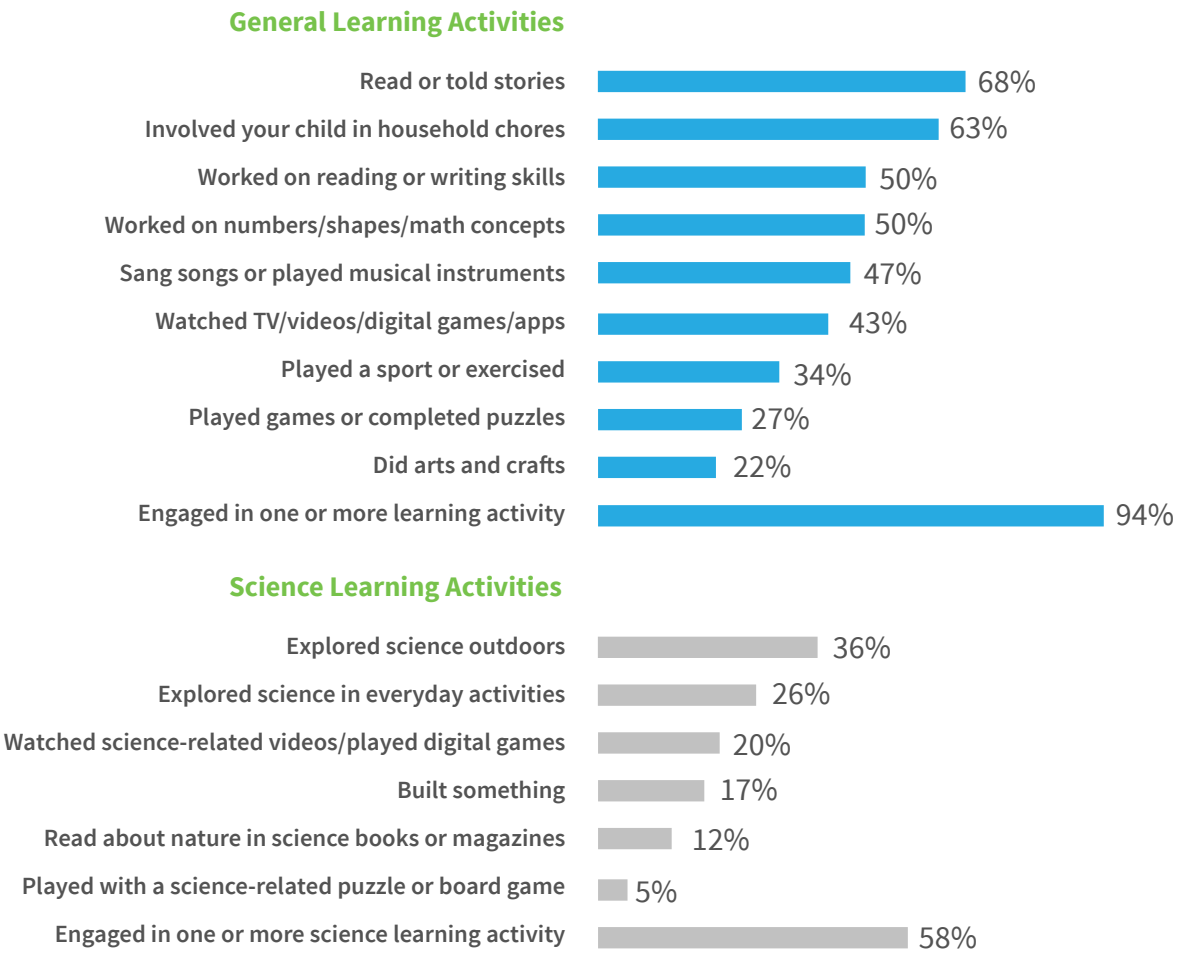
> *"I mean, any time we go out, he has to be reminded, you have to wait in line to do this. There's other people around you, so I hope that he learned something about that. I try to make sure when we're in social settings to be conscious of other people around them. There wasn't really much educational about all that, though."*

Over half of parents say they do science-related learning activities daily with their children.

Fewer surveyed parents engaged in science-related activities daily. These daily science-related activities most frequently included exploring science outdoors and exploring science in everyday activities.

When asked about the science learning activities they engaged in at home during their regular routines, many parents in the qualitative study described how science conversations arise from children's questions in their everyday lives. Most parents reported fielding questions about weather, animals, bugs, why the leaves change, or how the world works. In addition to describing science-related conversations, many parents also described cooking with their children as an everyday activity into which they could incorporate science.

Exhibit 6. Percentage of Parents Who Report Engaging in Learning Activities With Their Child Daily



Parent reports of science-related activities are wide-ranging.

In order to understand parent perceptions of the kinds of early science experiences that are most salient to families, the survey asked parents to describe in a few words the kinds of science learning activities that their children like to do.[5] Because the question was open-ended and unstructured, and prompted parents to think generally about science, responses should not be interpreted as a complete list of the science-related activities that children enjoy, but rather, the children's favorite science activities that were at the front of parents' minds.

Science and engineering practices

Researchers categorized parents' responses as science and engineering practices when they referred to actively engaging in science-related activities through investigation, exploration, or discovery. Nearly half of parents (40%) described at least one activity that incorporated science and engineering practices.

Life science

More than a third of parents in the survey (36%) described life science activities (the characteristics of, or observations about, living things) in their responses, indicating, for example, that their children were interested in animals and bugs, or in watching plants grow. Parents in our qualitative study also often described planting and gardening activities as typical family activities that involved science learning. Parents noted how these experiences teach their children about how plants grow and what is needed to keep them alive. As one Illinois parent observed, "We've dried a lot of tears from the kids, you know, their favorite plant didn't grow—'but honey, you didn't water it, or you didn't pluck out the weeds and the weeds took over your garden box'."

Earth and space science

Similarly, in the survey 32% of parents reported that their children enjoyed earth science activities (characteristics of the Earth and space), referring to nature or the outdoors and interest in the solar system with many reporting children's interest in the August 2017 solar eclipse. Some parents in the qualitative study engaged in earth/space science activities with their children. Many of the examples given centered around nature walks or visits to the science museum or were child-directed. Parents reported more conversations around earth science than specific activities.

[5] Based on a coding scheme developed using the PBS science learning framework, the Next General Science Standards, and the Head Start Early Science Learning Standards, researchers coded parents' responses for any references to science and engineering practices, science content areas, or non-science activities (including responding that they did not know what activities their children like to do). Responses could be coded as representing science and engineering practices and content, or for multiple content areas.

Physical science

Slightly fewer than a third of parents in the survey (29%) referred to activities related to physical science (the exploration of materials to investigate the properties of objects), such as making "slime," playing with water, or cooking. Families in our qualitative study described cooking with their children as a regular activity; some parents viewed these experiences as teaching their children to cook, while others explicitly drew out the science- or math-learning aspects of the experience.

> *"We're going to bake a cake, and so I was showing him, like, here's a quarter cup [measure], and a quarter cup is half of a half cup, and so we put the quarter cup of sugar in the half cup [measure], and then I showed him how another quarter cup fit in there, and that kind of made his brain go, 'Oh, okay.'"*

> *"Well, like, spaghetti, they'll ask, 'How do you cook it?' and I'll just tell them, you know, you put the noodles in the water and boil it […]. Heat is what makes it cook."*

Making "slime" was also a popular activity among families. In animated exchanges, parents shared recipes and experiences in focus groups, reporting that children find recipes on Youtube ("toothpaste and salt") or parents buy "slime kits." Children's enthusiasm for this activity seemed contagious to some parents. One stated, "I love it, it's fun to me. I can't wait till she gets into the older grades and actually has to bring home science projects and make them. It's exciting to me … I'm a science person when it comes to doing fun activities. I'm not a science person when it comes to like, you know, all the other stuff."

Engineering and technology

Few parents in the survey (12%) spontaneously indicated that their child enjoyed learning about engineering and technology—for example, building things or using scientific instruments. Parents in our qualitative sample indicated that their children regularly spent time building—for example, with Legos, Lincoln Logs, or other similar toys. However, this was generally not an activity that they engaged in together; rather, children tended to build independently and without parent prompting.

Perceptions that their children don't do science

Only 6% of parents reported that their children did not engage in science-related activities, because of age or interest, and only a few parents (4%) did not know what science-related activities their child liked to do. Another 8% referred to activities that were not related to science, such as colors. Findings from our qualitative study suggest that some parents may not recognize common family activities as related to science.

"I guess my main way to help my child would be to ask, 'What is science? Where is it, what is it? What activities could we do that could be related to science?' So … like [at] first, planting, I didn't consider it science, but I guess it really is, because if you think about it, it is science. So just knowing, like, and then maybe you can expand on it."

Parents in focus groups and interviews often described science activities implicitly, in passing and without recognizing them as such. They described cooking with their child, or exploring and discussing nature, discussing health and the body, and using Legos and building things as they were conveying another point. In these instances, prompting by researchers resulted in some parents coming to view these activities as helping their children learn science.

"I guess, balance, that's science, right? […] Yeah, balance and motion and, gosh, all this other terminology that I don't remember from 6th grade."

Further, some parents held a narrow, formal view of science as experiments and chemical reactions—such as making "volcanoes" at home with baking soda and vinegar—and so felt they engaged only rarely in science at home.

Parents with lower annual incomes were more likely than the highest income parents to say that they engaged in daily science activities.

It is important to note that parents across the family income spectrum reported frequently engaging their children in general learning activities every day—in other words, we did not find any difference between low- and high-income families and the kinds of specific learning activities they reported doing with their children. In comparison, low-income parents were more likely than parents with the highest incomes to engage children in science-related learning activities daily (61% of parents with an income under $25,000, compared to 48% of parents with an income of $100,00 or more). These differences did not seem to be associated with parents' education, as there were no systematic differences in parents' reports of daily activities depending on their educational attainment.[6]

[6] In addition, when parents' educational level was statistically controlled, we still observed a difference between high- and lower-income parents.

What Parents Say

As part of the qualitative study, researchers asked parents during the first home visit to keep a "journal" of their science learning activities by sending pictures, videos, and short messages to researchers via text or email. Following is a series of text messages sent by one mother in rural Tennessee, along with additional comments she made during the visit:

"[He] made his own helicopter airplane with Legos." [Attached was a picture of her son the builder holding his creation.]

"He said it was a helicopter slash airplane. He loves Legos. [….] He just made it up, a helicopter and an airplane together. He just made it [on his own]. He's always building. I like for him to make up his own stuff and be creative, but he does have, like—when he first got all the Legos, he had the little booklets to tell how you make things, and he really liked doing that, too."

"Talking about planets and doing a fun activity book with it."

"My mother-in-law gave it to me and it just has a bunch of science stuff about planets, and it even had, like, a little kind of board game on the pages. And just talks about each planet [….] It had some stickers to go with it, and just different kinds of things. I was helping him. He can't read yet, really, so I was helping him do it. [….] Some of the questions were kind of difficult, I thought, because you'd have to read this story and then answer the questions. But he—some of them he got, and some he didn't. They really like [the board game.] My oldest one [age 8] and me played the board game because the 3-year-old couldn't really do it yet. I don't know if [the 6-year-old] actually got, like, science out of it—like, what are the planets, and everything, but just one-on-one time with me. I think that's more fun with it."

"We also talked about sound waves on the way to town the other day, and watched videos on animals. My 3-year-old was very curious about what each animal was."

"We went to the gas station and they were doing—what's it called?—jackhammering. And he comes out, and he's like, 'It's so loud in there, they're jackhammering something,' and the boys were like, 'Why is it loud?' And, you know, because it's inside, and so we talked about how it's louder inside [….], why it's louder inside the building than outside. I was telling them like, sound, how it actually has waves and stuff, you know, and how it bounces off the walls and everything. That's what makes it so much louder. That's how I tried to describe it."

"This morning we talked about what makes clouds move."

"We were on our way to school and the clouds were moving. He's like, 'How do clouds move?' The 6-year-old. So we talked about that and why they move and what happens when they move and stuff. […] My 8-year-old was like, 'The wind is making them move'."

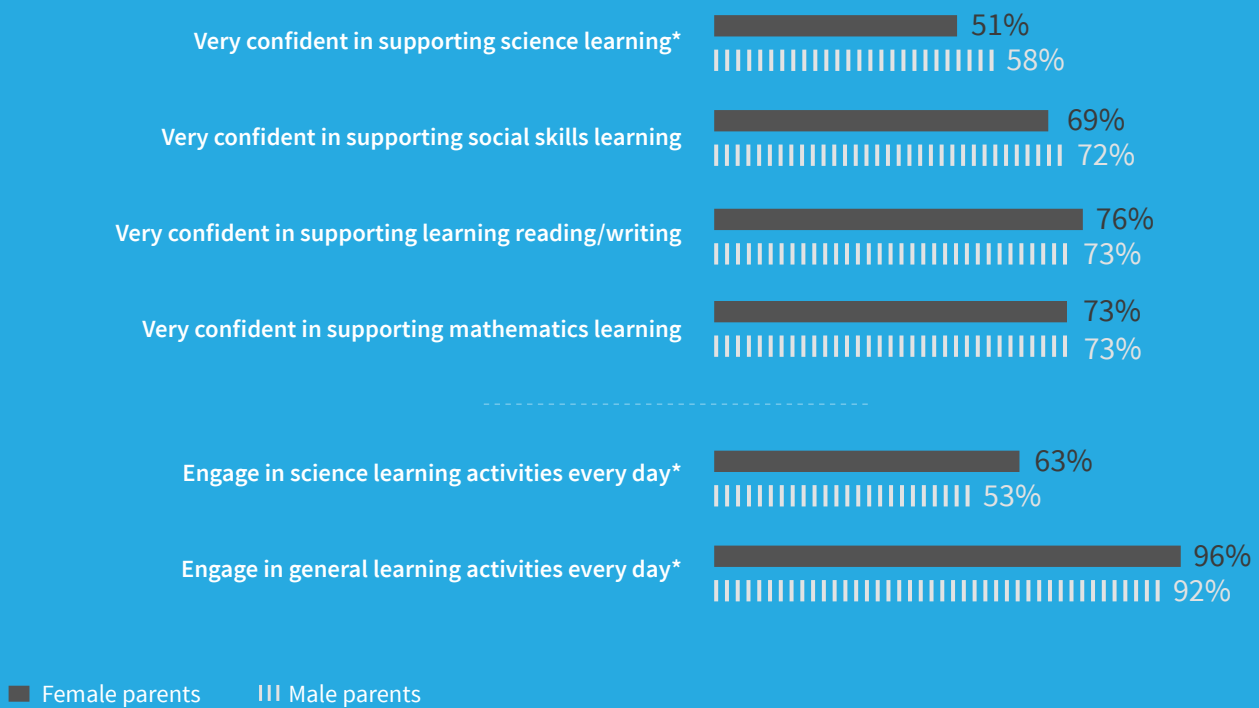
Gender-related differences in parents' early science beliefs and practices

There are well-documented gaps in the participation of women and girls in science-related professions. The information in this survey indicates some gender-related differences in parents' beliefs about early science learning and the ways in which they help their young children learn science.

Although similar percentages of male and female parents reported being very confident in their ability to support the development of their children's mathematics, reading, and social skills, female parents were significantly less likely to report being very confident in their ability to help their children learn science (51%), compared to male parents (58%). Female parents also are somewhat more likely than male parents to report being less confident in their ability to support science as compared to other domains of learning (23% of female parents, 18% of male parents).

Despite feeling less confident, female parents were more likely to report engaging their children in science-related activities on a daily basis. Among female parents, 63% reported engaging in some types of science learning activities every day, compared to 53% of male parents.

Exhibit 7. Parent-Reported Confidence in Supporting Children's Learning and Engagement in Daily Learning Activities, by Parent Gender



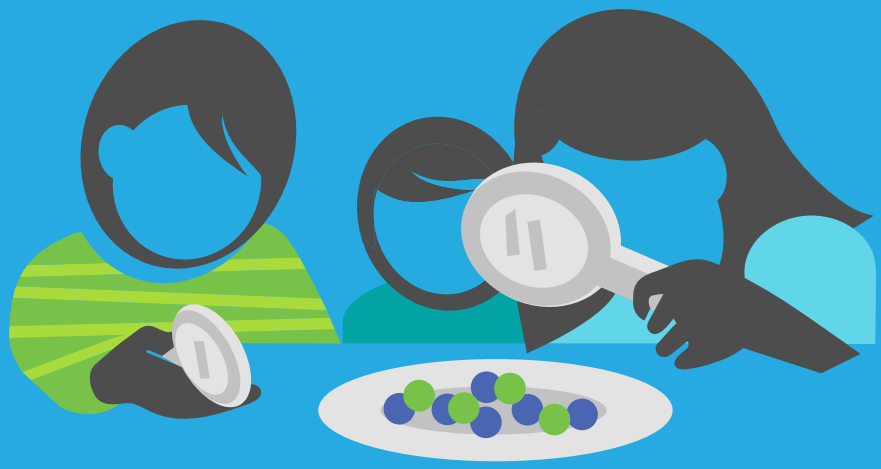
*Differences are statistically significant at the level of p<.05.

Finding

Most parents say knowing more about **early science learning**—and having concrete activity ideas—would help them do more science with their children.

Highlights

- **Seven out of 10 parents say having ideas for doing science with everyday materials would help them do a lot more science at home.**
- **Parents say having information about what children need to learn about science would help them do a lot more science together. (Parents with lower incomes and with lower levels of education were more likely to say this.)**



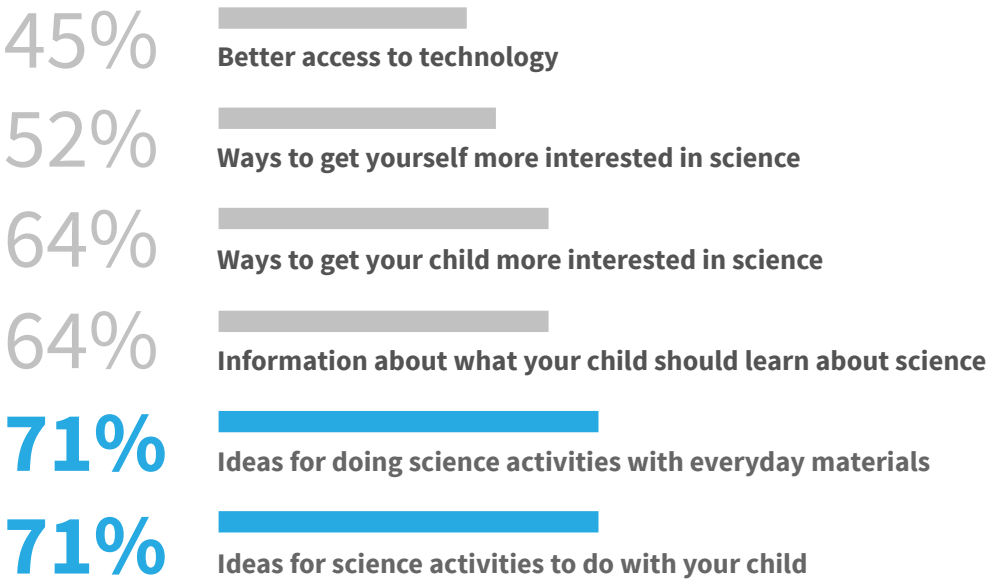
Supports for Science Learning

In order to better understand supports that families need to engage in science, the survey asked parents to indicate the extent to which specific kinds of supports would help them to do more science in the home.

Most parents indicated that ideas for science activities and information on science learning expectations would help their family do more science activities at home.

As shown in Exhibit 8, most parents indicated that more ideas for science activities, and ideas for doing science with everyday materials would help "a lot" in doing more science at home. Many parents also reported that having more information about the science that their child should learn would help them do more science at home, as would having ways to help their child become more interested in science.

Exhibit 8. Percentage of Parents Who Reported That a Given Support Would Help "a Lot" in Doing More Science at Home



Many parents in the qualitative study lacked confidence in helping their children learn. In some cases, parents felt they simply did not know enough, or did not know how to express ideas "right." A strong theme emerged in parents' desire for resources that target not only the child but also instruct parents on how to better teach their children. Parents also wanted these activity ideas to link to learning at school. Lastly, parents need things to be simple enough to fit into a regular day.

> *"I think identifying ideas that … I can do without it being, you know—I don't know if this is going to sound bad—but, like, a really huge thing. Because we're super stressed for time, too. So, I can't go and make her something that's going to take, you know, 20 minutes to set up and 30 minutes to do, and then an hour to clean it off of everything, and then she's freaking out, you know, I want it to be fun and enjoyable so that they want to continue to do it. And if it becomes more, like, work, she's not going to want to do it and it's just going to stress everybody out. So, something that I can make more common and make quicker, and integrate, like, maybe every other day, something fun to show her."*

In addition, researchers in the qualitative study heard and witnessed external barriers that affected parents' capacity to provide learning opportunities outside of school settings. Issues outside parents' immediate control—such as financial constraints, inadequate access to transportation, and employment schedules—provided daily obstacles to parents' supporting learning. Parents described difficulties finding resources that were geographically accessible and financially affordable. Financial resources often restricted parents' ability to engage with learning activities around them, from access

to transportation, access to media consumption through the paid services (such as Internet, cable, or streaming services), to data use and storage capacity on mobile phones. Conversely, parents who reported taking advantage of local learning activities also mentioned modes of transportation to get to parks or zoos, buying apps, or participating in local programs. While many parents with whom researchers spoke did report taking advantage of these various resources for learning, accessibility came up as a consideration with nearly every family.

Families with lower incomes were more likely to say that information and technology access would help "a lot" in doing more science at home.

Consistent with results from the qualitative study, results from our survey suggest that low-income parents may have different needs for supports compared to higher-income parents. Parents with lower incomes were more likely than those with higher incomes to indicate that each support would make it a "a lot" easier for them to do science at home. The largest gaps between lower- and higher-income parents related to access to technology, information about what children should learn about science, and ways to get parents more interested in or excited about science. (See Appendix B, page 66, for additional details about other income levels.)

Similarly, parents with lower educational attainment were more likely than those with higher educational attainment to indicate that access to technology and to information about what children should learn about science would help "a lot" in doing science at home.

What Parents Say

In Jackson, Mississippi, researchers visited a family of 7, (including a niece and nephew), headed by a stay-at-home mom in her twenties. During the visit, the children sat around the mom as she described their latest learning activities, including 1-on-1 homework time and making slime. One activity—planting a seed in the yard in front of their apartment building—garnered a lot of excitement. Here's how the mom described her family's experience:

"[My son] wanted to know, 'How did that tree get in the ground?' …What I did was, like when I was in school with my teacher, we grew a plant. So that's what we're doing in my house now, growing a plant, so he can see. I told him it wouldn't get as big as the trees are but he could see it grow.

I Googled 'How to plant a plant'… to make sure that I was doing it right. I hadn't done it in a while so I wanted to make sure it would sprout… Google always leads you to YouTube. So we looked at a video showing us how different people started planting different types of things, and how to take care of them.… I wanted to make sure that it was getting everything that it needed.

[After planting the seeds together], it started to sprout. Because it hadn't rained, we had to make sure we watered the plants, but not too much. So, here's a measuring cup, we're going to do a cup of water… I never was the type to measure stuff so when they said 'cup of water' I just think a cup of water so we made sure we measured everything and made sure we're doing it by the book so we could have a nice plant. Plenty of water, plenty of sunlight, and this weather, it's been really good sunlight. It's been pretty every day. It's coming out. I'm surprised, I was like, 'Oh, my god, it sprouted out.' Because sometimes I planted things and it didn't sprout, and I was like; what did I do wrong?

I believe that [my son's] amazement, he put the seed in there and he was like, 'Oh, my god." He goes down there and is looking every day and seeing that it's coming up out the ground. So he's really into it. Like I said, we stay in apartments, we can't just be planting all over these people's apartments. I think he learned most with the planting. And that's when he got all excited with what happens."

Finding

Most children use **educational digital media**, including science media regularly; parent reports suggest parents may be missing opportunities to deepen the impact on learning.

Highlights

- **According to their parents, young children regularly use science-related digital media—most frequently, viewing videos or TV shows about science.**
- **Although parents regularly encourage and monitor their child's science-related digital media use, they are less likely to help their child make connections between a show, app, or game and daily life.**
- **Slightly more than half of parents are satisfied with science learning media resources, but most do not think these resources have helped their child learn a lot of science.**

Media Supports for Learning

Perceptions that science is difficult and complicated pose a significant barrier for many families who might otherwise engage in science (Barton, Drake, Perez, St. Louis, & George, 2004). Media, such as TV shows and digital games, have the potential to help overcome some of these barriers, and to do so at scale by inspiring families and engaging them in science, as well as by supporting them by modeling language and scientific behaviors (Troseth, Saylor, & Archer, 2006). Moreover, children, including young children, spend a significant amount of time using media (Rideout, 2017).

Parent reports suggest that most families use educational media together weekly or more often.

Almost all parents surveyed (94%) indicated that their child had watched educational TV shows or videos in the past month, and most parents (84%) reported that their child had played a digital learning game or app in the past month. Many families also report using these media together; just under half of parents (43%) reported that they watched educational TV shows or videos or played with educational digital games or apps with their child daily.

Parents used learning-related media both to teach or to get information, as well as to keep their child occupied productively while the parent was busy.

Findings from our qualitative study suggest that parents use educational media—including television shows, YouTube videos, games, and apps—in the home for two primary purposes: as a way to teach or to get information and, most commonly, to occupy the child while the parent is busy. Less often, parents reported using educational media with their child for mutual entertainment; for example, one mother reported that both she and her child enjoyed watching the television program *Brain Games*.

Parents often described using media to get information to facilitate their child's learning. Across most qualitative interview sessions, participating parents reported using education media for learning purposes that ranged from academic skills (e.g., math, counting, reading, and spelling) to activities of basic living skills (e.g., increase frequency of brushing teeth, and how to properly wash hands).

Parents described turning to media to answer their child's questions, or help address a topic in an "appropriate" way. Parents explained that in some instances they trusted media to be able to address a topic or answer a question in a manner that was more appropriate than what they themselves would have done. For example, one parent explained that when her child was having a hard time adjusting to school and didn't want to go, she searched for appropriate media on YouTube to help talk to her child about it. A few parents in our qualitative interviews expressed the belief that their child learns more from educational media when they watch or play with a parent. They felt that a parent's presence increased the child's attention to the media.

> ***"Well, my 7-year-old actually learned her ABCs from Barney. She didn't learn it from me; like, she'd rather watch Barney singing his ABCs. So it's like, yeah, most … well, I'm not going to say most, but some things that they know, they learn from TV because they'd rather look at that than hear me talk, I guess."***

Many parents in our qualitative study reported that their child was learning from educational media, including television shows, documentaries, games, and apps. Parents felt their children learned letters, numbers, and colors from media. Many parents explained that their children were more willing to engage with, and learn from, media than through other modalities.

One factor that parents agreed made digital media a successful and valuable tool for learning was its ability to keep children engaged. Many parents explained that their children were more willing to learn and engage around media versus other activities. While this worried some parents, they all agreed that this was beneficial.

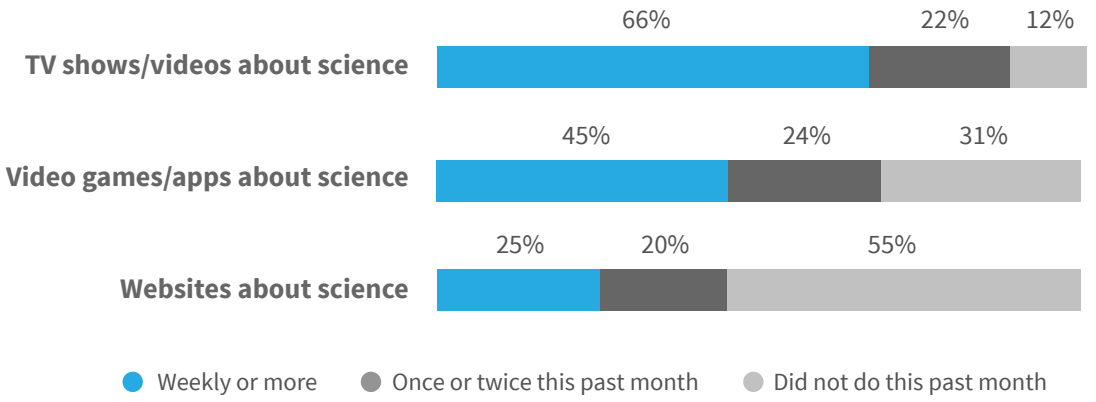
Science Media Resources

While much is known about families' digital media and technology habits generally, little is known about how these habits connect to science. To develop an understanding of this context, we asked parents to describe whether, and how, their children used different types of science media.

Parent reports suggest that many young children regularly use science-related media—most frequently, viewing videos or TV shows about science.

Virtually all parents reported that their child used science-related media at least once in the past month. Parents most commonly reported that their children watched educational TV shows and videos, or played digital learning games and apps, at least once in that time. About two-thirds of parents reported that their children are using these media frequently—weekly or more often (Exhibit 9).

Exhibit 9. Types of Science Media Children Use, by Frequency of Use



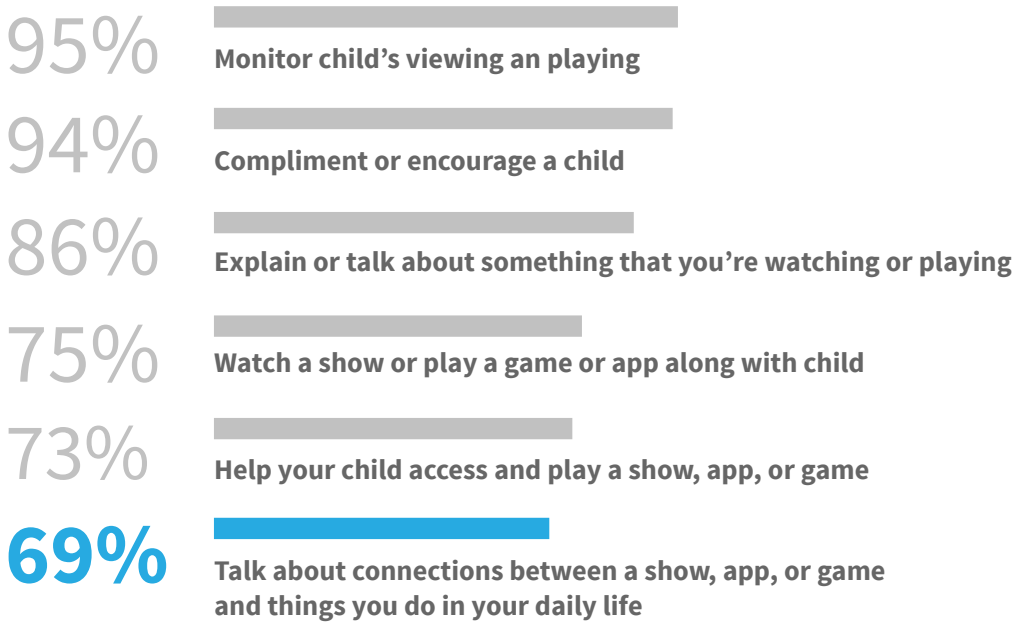
How Parents Use Science Media with Their Children

Although parents who were surveyed reported that children used science media frequently, it is not clear how the use of these media might support children's learning. To begin to understand this question, the survey asked parents about the ways in which they used the media with their children, with attention to the kinds of activities that research suggests are particularly effective for learning.

Parents regularly encourage and monitor their child's science- related media use, but are less likely to build on this for better learning.

To examine family media engagement patterns, the survey asked parents a series of questions about ways in which they interact with their child while he or she uses science-related media. Nearly all parents reported regularly (at least weekly) complimenting and encouraging or monitoring their child's science-related media use, but fewer parents reported regularly engaging with their children regarding the content (see Exhibit 10).

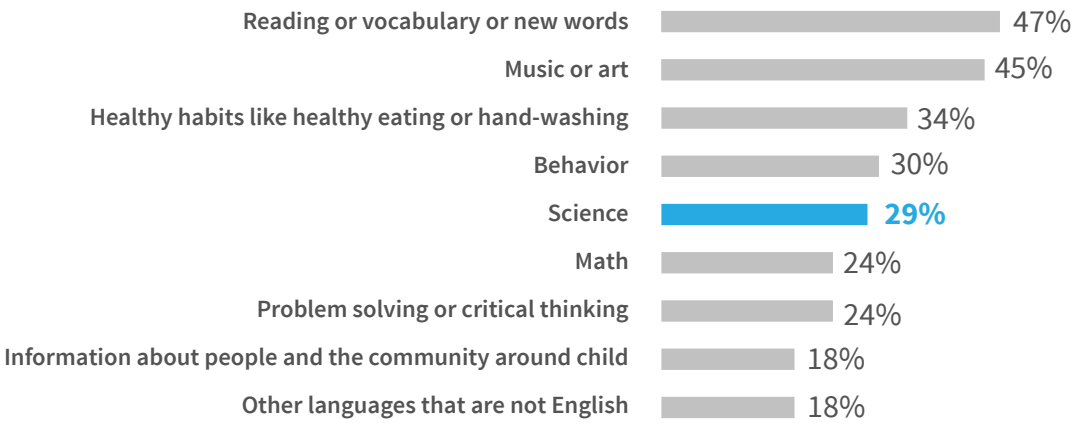
Exhibit 10. Among Parents Who Reported Using Science Media in the Last Month



Many parents are not satisfied with science learning media resources, and most do not think these resources have helped their child learn a lot of science.

When asked whether they were satisfied with the media resources available to help children learn science, about half of parents (54%) reported feeling satisfied. The survey further asked parents whether they felt their children were learning by using media. While the survey did not ask parents to explain this lack of satisfaction, a follow-up question asked parents about their perceptions of the role of media to support learning. Specifically, the survey asked parents the extent to which media was helping their children learn a variety of common topics. Most parents indicated that media represent an effective means to support their children's literacy, art skills, and knowledge, whereas fewer parents reported that their children learned a lot of science or math from media. (See Exhibit 11, below.)

Exhibit 11. Percentage of Parents who Reported That Their Child "Learned a Lot" From Various Types of Media



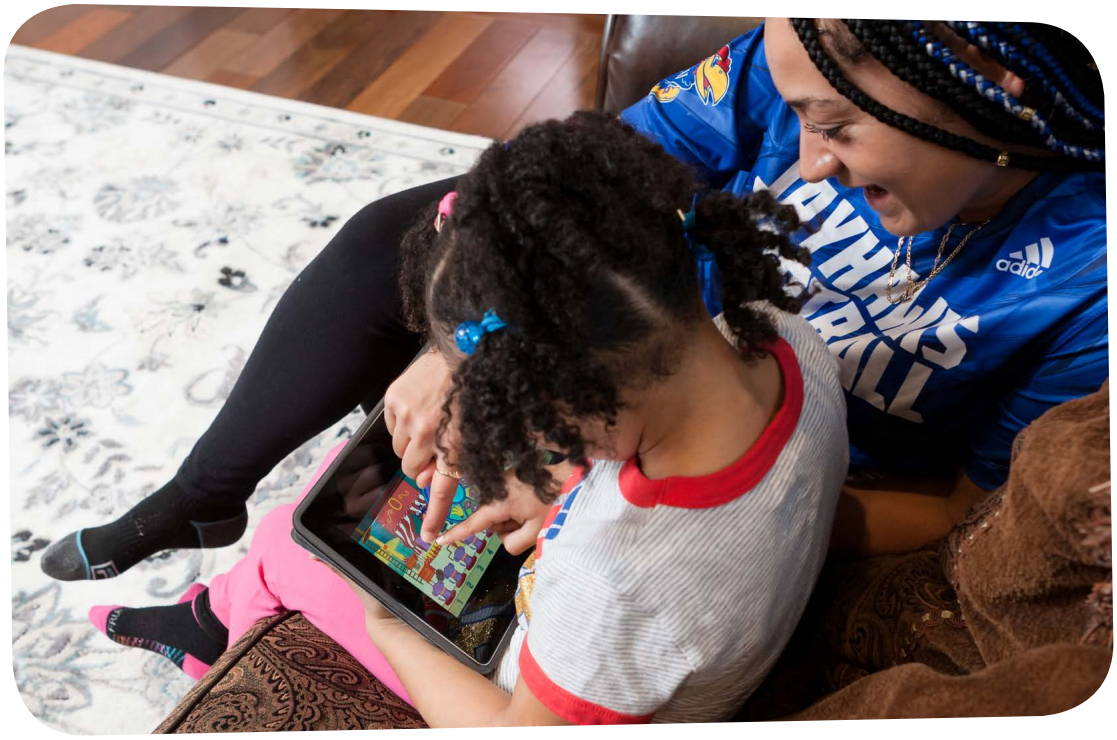
Parents' use of science media centers on TV shows and videos for entertainment, and using Internet searches for answers.

Parents in our qualitative study reported that their children often watched science-related TV shows, citing, for example, *Magic Schoolbus*, *Sid the Science Kid*, *Sesame Street*, *Nature Cat*, *Octonauts*, and *Wild Kratts*. Fewer parents recalled their children playing science-related games or apps. Of those that did, ABCMouse, Minecraft, and ScratchJr. were most frequently reported. Findings from our qualitative study about why parents use science media suggest that parents' science media use paralleled their general media use, encompassing both educational and entertainment-focused uses.

Science media for information

Much as with other topics (e.g., math), parents used sources such as Google and YouTube to answer their children's science questions or to expand upon science interests. In most cases, parents are not using media for broad information about science or its domains; rather, they are searching for information about a specific topic. These instances of informational science media use often involved joint parent-child engagement in an activity, although parents typically controlled the media when searching for information. For example, one parent described "Googling" a bug they found on a walk, as a means of identifying it. Another mother described searching YouTube for answers to her children's questions about why Play-Doh bath soap does not dissolve. In addition to finding information, some parents also use media to search for science-related activities to do with their children, such as making "slime" or cooking.

Media not only serve the role of answering children's questions, they also generate questions and conversations. For example, parents described episodes of *Nature Cat* spurring questions about nature and animals, and *Octonauts* leading to interest in the ocean and fish. One parent reported



that her son asked—and then answered—a question about where snow comes from as a result of watching a television program about it.

Science media as entertainment

While many parents acknowledged that their child used or watched science media, most did not actively seek out science-related media for their children. They also did not seem to have explicit goals or skills that they hoped their child would take away from science media. Echoing findings in the survey about parent perceptions of the value of media for learning, parents in our qualitative study often seemed to value science media more for its ability to entertain children, rather than to educate them. Very few parents were engaged with watching science TV shows or playing science apps with their children.

Even though they might not intentionally select science media to promote science learning, parents felt as though their child was learning science from certain media. Unlike general media use, parents typically attributed opportunities for science learning through media to television shows and documentaries versus games and apps. However, some parents felt that their child did not focus enough on the educational content of science media to learn from it. Rather, their child was watching to be entertained.

> *"I asked him when he was watching, I was like, 'Do you know what they're saying? Do you understand?' He was like, 'No.' But now he can talk about the stars and the moon, but I don't think he ever actually pays attention to that cartoon, actually what they're talking about."*

The ways in which parents reported using science media did not differ by income or education. However, parents with lower levels of education were less likely than parents with more education to report that their children had learned a lot about science from media.

The survey data showed few differences by parent income in the ways families reported using science media. However, across all topics except for science, families with lower incomes were more likely than were families with higher incomes to report that their child had learned a lot from media. We found no difference by family income in parent reports of whether their child had learned a lot of science from media.[7] We did find that perceptions of the value of media for supporting learning differed by parent education. Considering science, in particular, parents with lowest educational attainment were less likely to report that their child had learned a lot about science from media.

Media Curation and Selection

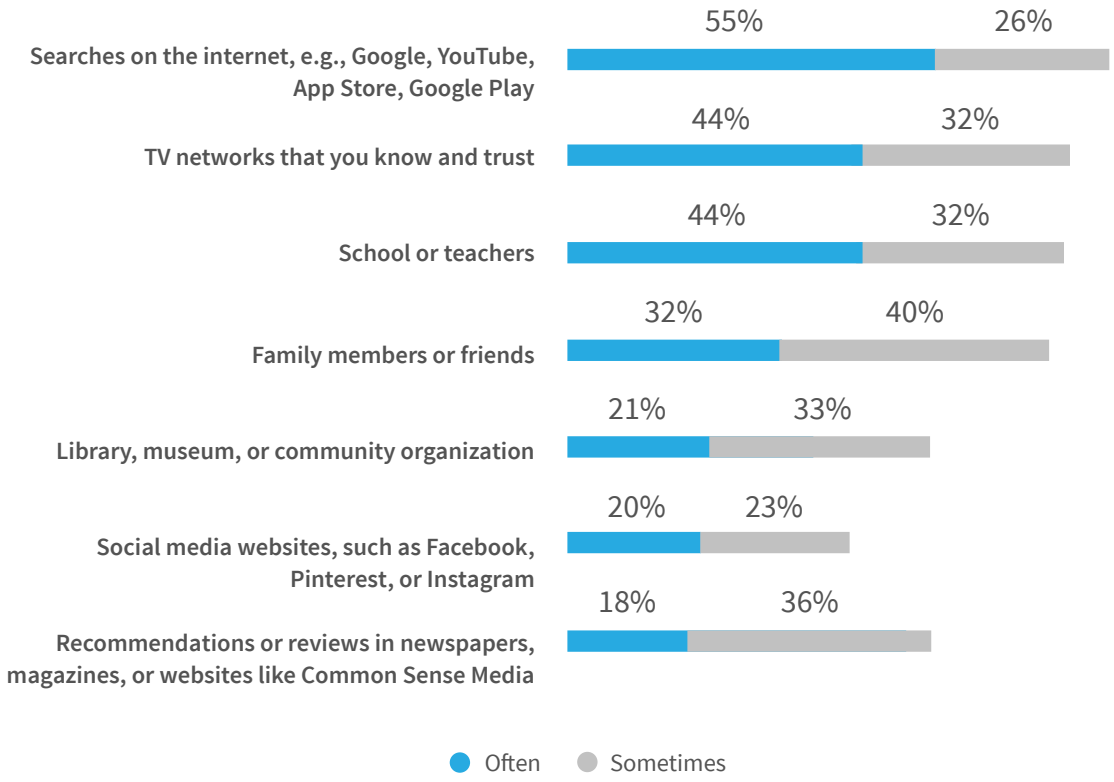
Parents use Internet searches, trusted TV networks, and teachers to find educational media.

The survey asked parents how they find educational videos, games, and apps for their children. Parents' responses indicate that many turned often to Internet searches, relied on television networks that they know and trust, and got recommendations from teachers. Relying on libraries or other community organizations, social media, and recommendations from periodicals or websites was less common. Parents reported using an average of just over two resources to find educational media.

Results from our interviews and focus groups similarly suggest that while some parents were more active in choosing the specific media with which their child interacts, through searches and recommendations, others put their trust in certain established "educational" resources (ABC Mouse, PBS, Leap Frog, Learning Academy) to provide educational content and teach their child.

[7] This pattern held true after accounting for family education. Parent reports of how satisfied they were with science media did not differ across education and income levels.

Exhibit 12. Percentage of Parents Who Reported Often or Sometimes Using Various Sources for Information Regarding Educational Media



Some children select media without parent involvement.

Findings from our qualitative study suggest that some children select their own media, and this may be taking place despite parents' best intentions of monitoring their child's media use. Some parents reported that they curate their child's media use for educational content, while others gave their children freedom to select the media they used. Parents who allowed their children to choose media often seemed to trust that media would teach and entertain the child, and stated that their child was a more savvy media user than they themselves were.

> *"They can work my phone more than I can. And all my kids, even my 3-year-old, they all got their own tablet. … My 3-year-old, he shows me when he's on YouTube and … he could be experimenting and stuff or he could be watching the craziest stuff. … It's amazing how even a 1-year-old just knows how to press my power button on this phone. I still don't even know how to work SnapChat."*

Other parents put more emphasis on curating their child's media use toward educational goals, often by selecting apps that they perceive as educational.

"Because it has a lot of games, and they're not games that waste time, but rather they're something productive to do with their time. Because he's going to learn what the letters sound like, he's going to learn to form words, and he's going to look for... I mean, I feel like it helps him plenty."

While parents differed on the degree to which they curated their child's media use, most acknowledged a need to limit children's media use in terms of content and/or duration. They expressed concerns about excessive media use, including the risk that their child could access inappropriate content, could become lazy, or could choose media use over other activities, such as outdoor play.

The kinds of searches parents often used to find educational media differed by income.

In our survey, lower-income parents were slightly more likely than higher-income parents to indicate that they often used social media, reliable TV networks, internet searches, library and other community organizations, and reviews in periodicals or online to find educational media. In part, this finding may be due to the fact that low-income parents referenced slightly more sources for educational media on average, compared to higher-income parents (lowest-income parents reported using 2.6 resources on average, versus 2.0 resources for the highest-income parents). We found no differences in search methods by family education level, however.[8]

[8] When we controlled for differences in family education, the relationship between income and varying search methods remained largely the same (although lower-income families were no longer more likely than higher-income families to use trusted TV networks and internet searches).

What Parents Say

During one of the home visits to Sycamore, Illinois, a Spanish-speaking mother told researchers how she carefully controls her son's use of games on his tablet. They do not own a television; consequently, outside of watching YouTube videos on her smartphone, most of his media use takes place on the tablet. Because she lacks Internet access at home, she goes to the library to get online and download appropriate apps for her two children. She does her best to provide them with educational media despite her financial constraints.

Her son's favorite app is one she selected after researching many reviews of games for children. The app is available in English and Spanish, and is designed to teach children hygiene and self-care as they help a character wash his hands, brush his teeth, go to the bathroom, and other hygiene-related activities. This mother described learning English as her biggest challenge when it comes to helping her son learn, especially as his English language skills quickly surpassed her own; for now, she is limited to games that she can review in Spanish. Here's how the mom described what she likes most about the app.

"They see that Nico brushes his teeth, and they know that they have to brush their teeth, wash their hands ... and in the morning, he reminds me, 'Mommy, Nico... ,' and I tell him, 'Yes, now we're going to brush Nico's teeth. First you brush yours, and then we'll brush Nico's.' He didn't like to brush his teeth—neither he nor his sister. It was a tough battle. My partner and I would have to hold him and brush his teeth, and he would have a total fit. And with this app, where he sees that Nico brushes his teeth and that nothing happens to him, and Nico doesn't cry, he realized that nothing is going to happen to him either, and that he doesn't need to cry, and that it's something he needs to do for his own good. Now they do it, they brush their teeth and don't cry, neither of them. For me, it's great. They also didn't like taking a bath, and now it's hard to get them out of the water."

Parents' beliefs and practices about early learning change as their children age

Parents' beliefs and practices likely change as their children develop. This survey helps shed light on the ways in which parents' needs related to early learning shift as children progress through the preschool period.

Parents with older children were more likely to report feeling very confident about teaching academic and social-emotional skills compared to parents with younger children—with the notable exception of science skills. For example, 69% of parents with 3-year-olds reported feeling very confident about teaching their child reading at home, compared to 82% of parents with 6-year-olds. Parents' reports of confidence in teaching math and social-emotional skills followed similar patterns. For science, however, only 54% of parents with 3-year-olds and 55% of parents with 6-year-olds reported feeling very confident about teaching their child science at home.

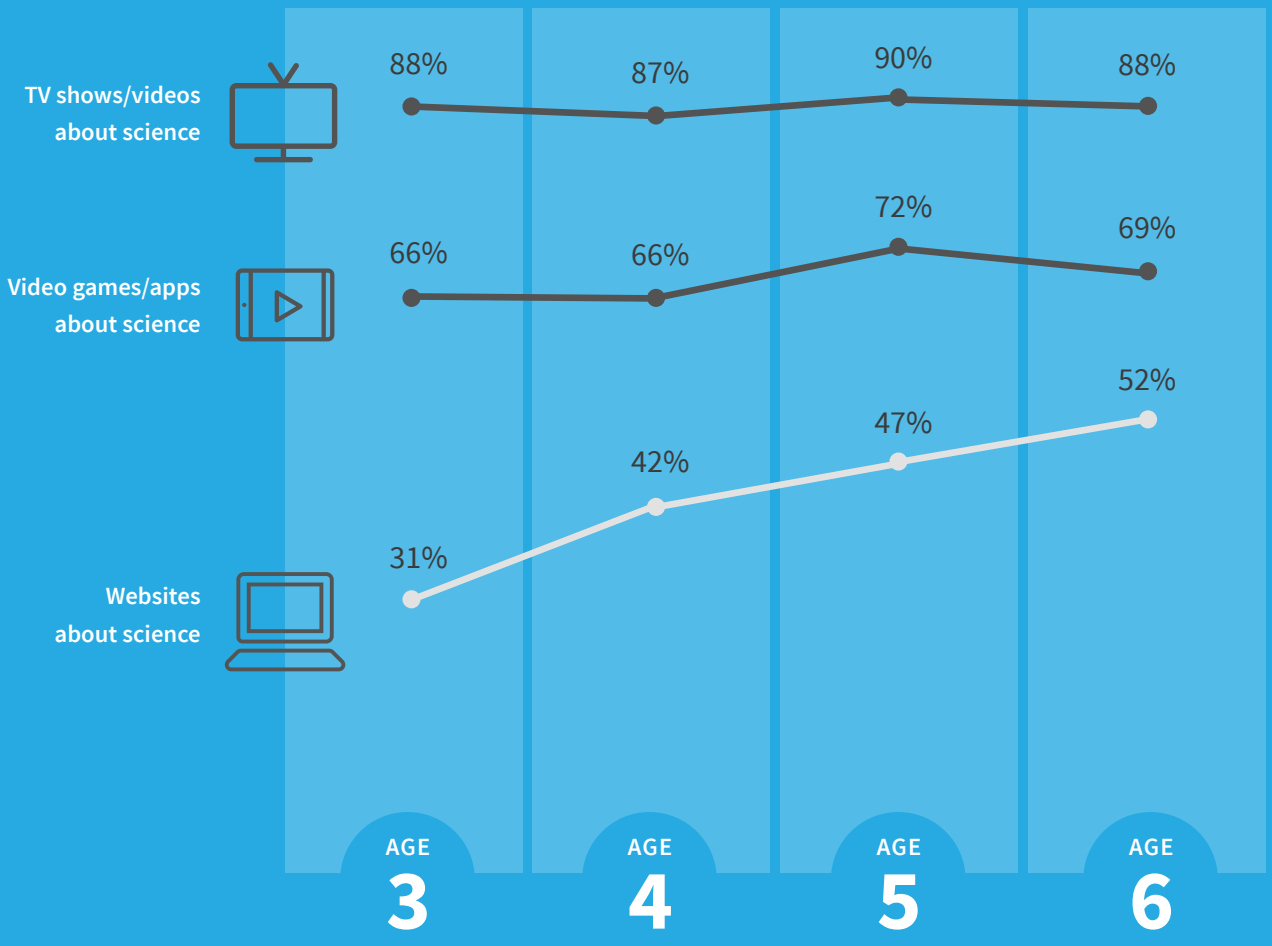
The frequency with which parents reported engaging in any learning activities and in science-related learning activities in particular also depended on the age of their child: Parents with younger children were more likely to report engaging in learning activities compared to parents with older children (97% of parents with 3-year-olds versus 91% of parents with 6-year-olds). Parents of younger children also were more likely to report doing science daily than were parents of older children (65% of parents with 3- and 4-year-old children versus 54% of parents with 5- and 6-year-old children).

Though they frequently engaged their 3-year-old children in learning activities, parents with 3-year-olds seemed particularly interested in receiving more ideas for science activities. Some 78% reported that this would help a lot, compared to 69% of parents with 4- through 6-year-old children.

Parents of older children were more likely than parents of younger children to report that their children use science-related websites to get information or learn something about science. Use of other types of science-related media was consistent across the age ranges (see Exhibit 13).

Parents of older children reported greater satisfaction with media resources compared to parents of younger children. Only 25% of parents with 3-year-olds reported that their child had learned a lot of science from media, compared to 36% of parents with 6-year-olds. This pattern also was true for math and problem solving, but not for reading, music, or art, healthy habits, behavior, information about the community, or languages other than English.

Exhibit 13. Percentage of Parents Who Report That Their Children Engaged With Various Types of Science-Related Media at Least Once a Month, by Child Age



What Parents Say

Many parents indicate their child can learn from media, but parents had different beliefs about their own role when their child used media. Some parents took an active role, engaging with media along with their child, while others felt their main responsibility was to select appropriate content.

One mother of three children described living in a town that has recently experienced an uptick of violent incidents. She said she makes sure to set up a home environment that is conducive to learning, complete with flashcards, blocks, and books. Between the birth of her first and third child, she earned her degree in child development and told researchers how her practices changed over time based on what she learned from her classes. For example, she moved from spanking her children to talking through their behavior with them. She explained that she sees herself as her children's primary source of learning, and she has noticed that her daughter gets more out of media when she watches and engages with an adult.

"I think it's more effective with me … I watch *Super Why* with my daughter … and I'm like, 'Sound it out. What does that sound like? Sometimes she'll engage, sometimes she won't, but I know when I'm sitting, like, right there with her, or if I noticed she's disconnected, I'll sit next to her, like, 'Oh, what is this?' So, I think with me being with her, it helps her a little more. I think the tools are the reinforcement of what I tell her. So, I always think of any other outside tool as just something to reinforce."

Another mother we spoke to saw the media her son consumes as the resource doing the work and thought of herself as a bystander. She described herself as someone who needs to come home and spend time alone. She has a teenage son who follows his interests in gaming and engineering alone in his room. Her youngest son, though, is a social butterfly who enjoys watching television and talking to other people. He enjoys math, and eagerly shared math facts with researchers during our visits. She said he shares with her what interests him.

"I'm really not the social type, so it's like when I get out of work, I pick him up and we head home until the next day. Our routine is the same: school and work and back home. The TV actually stays on PBS. That's his learning system. You know, when he thinks he's going to learn something new, he'll be like, 'Mama, Mama, I know how to write. Mama, I know what 8 plus 6 is.' That's the only channel he actually watches. I don't have cable, because, like I said, I'm not a big TV person. So, regular TV, that's what it stays on."

Where We Go from Here

These study findings offer the opportunity to listen closely to what parents have to say about supporting their young children's learning. Often parents of young children are described in ways that highlight their deficits, or that point to their absence in their children's lives, but rarely do parents get to say what they are thinking and feeling when it comes to their child's learning. In this survey, and throughout the home visits and focus groups, we tried to give parents a voice about a topic that is gaining importance in education and in life. We live in a rapidly changing world where technology, medicine, communication, and many other fields that touch our lives are shifting and transforming in ways we could not have imagined when we were young. Yet, for parents, the job is to prepare children for this new world so that they can solve the problems they encounter, and develop the skills and knowledge they will need as they transition to adulthood and independence. In this new world, science and the process of scientific thinking that seeks to ask and answer questions will be essential for everyone. It is in this context that the findings of this study fit into the larger picture of young children, their families, and learning.

There is growing recognition that the early years in a child's life may be the most transformative and essential to laying the groundwork for later linguistic, conceptual, and mathematical understanding, and that the role of early science learning should be part of this groundwork. There also is growing evidence that interactions with parents are crucial in setting the foundation of these skills before children start school. Yet parents are unprepared to support science because they have no prior experience to draw on, and there are few supports or opportunities to learn about how to engage and support young children in developmentally appropriate science experiences. Even parents of older children note that they rarely or never see their elementary school children come home with science homework or information, and the few tasks that do come home from school are not connected to a full curriculum but rather are single stand-alone activities. Educators of young children, for the most part, also are not prepared to support science learning, and so children's and their parents' exposure to well-designed and age-appropriate content is limited to those with the financial resources to purchase or travel to experiences, or to those with more educational experience to draw on.

Despite these barriers, many parents feel that science is important for their young children, and many parents are helping their children explore science through engaging in conversations about science in their everyday lives as they walk to work or visit the park, providing their children with opportunities to observe, experiment, ask questions, and wonder. However, a substantial number of parents do not feel science is as important as other school readiness skills for their children to learn, are not confident enough, and do not feel knowledgeable enough to undertake the daunting task of helping their child learn science. These parents are working hard to support their

children, but report that they frequently do not know what to do, or why; they understand that looking at the night sky could be science, but what next? They wonder how they build on this experience, and want to know what their child is capable of understanding about the sky at such a young age. Many parents recognize that the learning taking place in young children's lives happens in the world around us, but are often unsure of how to organize and support these experiences.

What we heard from parents is an interest in, and need for, more information about what is important about science for their young children, how these experiences can help prepare their child for school, and about how to do science with them. Some parents also want to know more science themselves so that they can help their children. For those parents who are less confident in their own knowledge about science, this information can give them a sense of confidence when talking with their children and engaging in these new learning activities. Commonly, even parents who do talk about science with their children often describe fitting science into their everyday experiences, when they are walking outside, going to the park, digging in the back yard; helping parents to see science in the everyday and giving them ideas for how to do science with their children in this context could be a critical support. Doing science with their children also can feel risky to some parents because they perceive themselves as not having the "right" answers. Some parents may need more encouragement to feel comfortable learning alongside their children, rather than teaching them directly.

Our study findings suggest that most young children are watching TV and video weekly or more often (and using digital games somewhat less frequently) and some parents feel that media can be an effective tool for learning, especially reading and music. Findings from our qualitative study suggest some parents also value educational media for its ability to engage their children in learning, although parents also worried that their children had trouble disengaging from media. Most parents say their children use science-related media weekly or more often and some parents reported they are more likely to use science media for their child's entertainment than for a targeted learning experience. Many parents also used science media themselves, to find an answer to their child's science-related question or to find models and ideas for science activities.

Our study also suggests that parents may benefit from knowing more about how to provide supports to help children learn from media, such as connecting what their child is watching to real life. Because many parents use educational media to occupy their children while they are busy with other tasks, finding practical ways to help parents extend children's learning will require much more than superficial encouragement to "engage together."

Given media's widespread availability and near universal access through television, computers, smart phones, and other devices, there is the potential to bring opportunities for, and information about, science learning into homes and directly to children. But simply supplying content is not adequate, even if it is an important first step.

Parents and their children need information and resources that reflect high-quality science content, presented in ways that are clear and developmentally aligned with young children's learning trajectories. Media that engage both adults and children also can serve to overcome barriers that prevent some adults from doing science with their child; appealing to both generations can help to ensure that parents are able to provide the supports that children need to learn from their media experiences. Adults who care for young children also will benefit from media resources that are clearly written, directed at adults and parents of young children, and that support the development of knowledge about early science learning and the kinds of activities and conversations that can support this learning.

Meeting the needs of all young learners and their families is a goal that is beyond the reach of any single program or project, but by listening to parents, hearing their concerns, and responding to their needs, we may be able to enhance the learning experiences for many young children across the country in ways that will help them prepare for more successful school and life experiences.

Five Essential Messages

By supporting parents' understanding of how to engage their children in science, we help children develop the thinking skills that are important for their academic success broadly, and not just for science. Over the past decade, we have seen parents, particularly low-income parents, increase the time they spend interacting with their children, through regularly reading books and accessing more resources (such as digital games, apps, and video content) to help their young children read. Part of this shift includes parents' recognition that children benefit from help to develop early literacy skills well before kindergarten (Bassok et al., 2016). Supporting the development of critical thinking and problem-solving skills through science content may be the next step to continuing to close persistent achievement gaps. With the right supports, more parents will be able to take advantage of their young children's natural curiosity and questioning to help build their science understanding and knowledge about the world. Here are our messages for those interested in this research.

1

Parents don't have to be scientists or know the "right answer" to help their children learn science. Parents are uniquely able to notice, respond to, and extend their children' questions, wondering, and interactions with the world during their everyday routines—and can do so on a daily basis. By letting children take the lead, parents can build on children's curiosity through asking question and looking for answers together. Parents who worry that they don't know enough about science can take advantage of media—including television shows, videos, apps, and games—as a jumping-off point to explore science questions in the real world and to make connections to their children's everyday lives, and to model for children that science is about asking and discovery, not just knowing the right answers.

2

Parents are crucial to young children's science learning and science exploration can start with wondering aloud and be reinforced with materials tailor-made for families. Organizations supporting parents can reinforce how important parents are in helping cultivate their children's curiosity. No matter how little science they feel they know, parents play a special role in fostering their children's science experiences through talking, asking questions, and searching for answers together. Parent advocates can take to heart that parents feel responsible for helping their children learn and can emphasize that the thinking skills and knowledge that underlie early science experiences are critical for later school success. Parents need more than encouragement—they require well-constructed and high-quality resources that provide ideas about how to do science in ways that easily integrate with their routines and that don't require special or costly materials and extended amounts of time. Low-income families, in particular, need improved access to these kinds of resources. Parents feel a responsibility to help their

children learn and be ready for school; they need to know that science experiences are important, not only for learning science but also for helping their children develop important critical thinking, socio-emotional, and communication skills that are essential for success in school and life.

3

Science is for home, school and all the places in between. Preschools, schools, and teachers must emphasize that science is critical for the early years, both in early education settings as well as at home. Findings from our qualitative study suggest that many parents use school expectations as a guide for what kinds of learning are important. If science gets short shrift in school, it will at home, too. Educators can help connect science learning at school with science experiences at home. Schools and educators can provide parents with ideas for activities that encourage conversations between children and their parents, siblings, and grandparents to explore the science in their communities, and that help children make connections between science experiences at home, school, and in their communities. Policymakers and administrators have to ensure that science is part of the curriculum at school as well, given that science-related experiences may not be happening in all homes.

4

Science is watchable, readable, playable and doable. Media producers can inspire and encourage parents, showing them how to use everyday opportunities to help their children learn science. Producers can get this message out to the widest public audience and can reinforce the importance of early science in and out of school. Media producers can engage families by developing resources for both parents and children that include clear, high-quality, developmentally appropriate science content that models ways to engage with science concepts, practices, and activities. It is important to ensure these resources are available widely and freely. Parents (and children) must be able to find and identify resources that are appropriate for their children's ages and interests and that allow them to build knowledge over time. Parents also need media content that can help them understand why science is important, why parents (along with schools) are in a unique position to help their children do science, the early science learning skills and knowledge that are important, what doing science looks like for young children, and the kinds of activities and conversations that parents can use to extend and support their children's science learning and attitudes.

5

What parents need to engage in everyday science with their young children doesn't need to be a secret. Researchers can extend the work of producers, parent organizations, educators and parents themselves by studying how to lower the barriers that parents face in helping their children learn science. Those who study young children, families and learning can identify specific effective practices that parents, early childhood educators, and children can use to increase exposure to and positive experience with high-quality science. In addition, researchers must ensure that their findings are accessible to all stakeholders, including families, teachers, professional development providers, administrators, and developers of science resources.

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Appendix A: Methodology Report

Parent Survey

Survey Sample Design

The sampling procedures were designed to efficiently reach parents and guardians who have a child aged 3 to 6 in their household. With this in mind, the sample capitalized on the ability to recontact respondents who had been reached via dual-frame RDD sampling using the SSRS Omnibus survey. Households who were identified as meeting the parental and income qualification criteria (both on landlines and cell phones) were recontacted and rescreened for this study.

SSRS Omnibus utilizes an overlapping dual-frame design, with respondents reached by landlines and cell phones. The RDD landline sample was generated through Marketing Systems Group's (MSG) GENESYS sampling system. MSG is one of the survey research industry's largest statistical sampling companies, and is a supplier to social science researchers and governmental organizations such as the U.S. Census Bureau and the Centers for Disease Control. The standard GENESYS RDD methodology produces a strict single stage, Equal Probability Selection Method (epsem) sample of residential telephone numbers. In other words, a GENESYS RDD sample ensures an equal and known probability of selection for every residential telephone number in the sample frame. The sample was generated shortly before the beginning of data collection to provide the most up-to-date sample possible, maximizing the number of valid telephone extensions. Following generation, the RDD sample was prepared using MSG's proprietary GENESYS IDplus procedure, which identifies and eliminates a large percentage of all non-working and business numbers.

Using a procedure similar to that used for the landline sample, MSG generated a list of cell phone telephone numbers in a random fashion. Inactive numbers were flagged and removed utilizing MSG's CellWins procedure.

Table 1 details the final sample composition by telephone type.

Table 1: Completed Interviews by Telephone Type

	Total
All completed interviews:	**1,442**
Phone type:	
Cell phone[1]	1,004
Landline	438

1. A total of 762 interviews were completed with respondents whose households can be reached by cell phones only.

Table 2 details the demographic characteristics of the final survey sample.

Table 2: Sample Demographics (weighted)

	%	N
Household income		
Annual income less than $25,000	16.1	228
Annual income $25,000-$50,000	24.3	343
Annual income $50,000-$75,000	20.4	288
Annual income $75,000-$100,0000	17.4	246
Annual income $100,000 or higher	21.7	307
Parent highest level of education		
Less than high school	12.6	183
High school	22.1	318
Some college	31.3	452
College graduate or higher	33.8	488
Parent gender		
Parent is male	45.9	661
Parent is female	54.1	781
Child age		
Three years old	16.8	243
Four years old	20.5	295
Five years old	31.1	448
Six years old	31.6	456

Questionnaire Design

The survey questionnaire was developed by EDC and SRI, in consultation with the SSRS project team. When available, researchers used items from existing and validated surveys. These include survey questions based on the Parent Reading Belief Inventory (DeBaryshe & Binder, 1994), NCES National Household Education Survey (National Center for Education Statistics, 2012) and Early Childhood Longitudinal Survey (National Center for Education Statistics, 2011), and the Learning at Home: Families' Educational Media Use in America survey (Rideout, 2014).

In order to inform questionnaire design, researchers conducted six focus groups with 40 parents of young children in rural, urban, and suburban areas in the South, Midwest, and western U.S. Parents represented a range of ethnicities, languages, and income and educational backgrounds. The focus groups, coordinated by Delphyne Lomax of V&L Research and Consulting, Inc., focused on parents' perceptions of early learning, science, and media. Based on the feedback and specific language parents used during focus groups, researchers created or adapted survey questions. These questions then were reviewed by three

experts in measurement, family engagement in learning, and media use. Based on this expert feedback, researchers revised survey questions again. Using these draft survey questions, researchers interviewed eight parents from a range of ethnic and socio-economic backgrounds to ensure wording, grammar and syntax, response options, reference periods, and meaning were appropriate. Next, SSRS researchers reviewed items with attention to language for use in telephone surveys. Once finalized, the questionnaire was translated into Spanish so respondents could choose to be interviewed in English or Spanish, or switch between the languages according to their comfort level.[2]

Prior to the field period, SSRS researchers programmed the survey into CfMC 8.6 Computer Assisted Telephone Interviewing (CATI) software. Extensive checking of the program was conducted to ensure that skip patterns and sample splits followed the design of the questionnaire.

Field Procedures

Pretesting

Nineteen pretest interviews were completed prior to the field period. The live pretest of the survey instrument was conducted on August 23 and August 24, 2017. SSRS provided recordings and a detailed summary of pretest findings, which included feedback from the interviewers. The final draft of the questionnaire was revised on the basis of the pretest. Changes were made in order to shorten the survey instrument, and to improve respondent-comprehension of questions.

Survey Administration

The field period for the survey was August 31 through October 8, 2017. All interviews were completed through the CATI system. The CATI system ensured that questions followed logical skip patterns and that complete dispositions of all call attempts were recorded.

CATI interviewers received written materials about the survey instrument and received formal training for this particular project. The written materials were provided prior to the beginning of the field period and included an annotated questionnaire that contained information about the goals of the study as well as detailed explanations as to why questions were being asked, the meaning and pronunciation of key terms, potential obstacles to be overcome in getting good answers to questions, and respondent problems that could be anticipated ahead of time, as well as strategies for addressing the potential problems.

Interviewer training was conducted both prior to the study pretest and immediately before the survey was launched. Call center supervisors and interviewers walked through each question from the questionnaire. Interviewers were given instructions to help them maximize responses and ensure accurate data collection.

SSRS enacted the following procedures during the field period:

» Each non-responsive number was contacted a minimum of 7 times, varying the times of day and the days of the week that call-backs were placed, using a programmed differential call rule.

2. A total of 153 interviews were completed in Spanish.

- Respondents were offered the option of scheduling a call-back at their convenience.
- Respondents were allowed to phone back on our 800 number if they chose to do so.
- Interviewers immediately called back any Spanish-language respondents that were reached by a non-bilingual interviewer with a bilingual interviewer.
- Interviewers left messages on answering machines at the third and fifth consecutive attempts when answering machines were reached.
- Interviewers explained the purpose of the study and, when asked, stated as accurately as possible the expected length of the interview (~25 minutes).
- Specially trained interviewers contacted households where the initial call resulted in a refusal in an attempt to convert refusals to completed interviews.
- All respondents were offered a $5 incentive for participation. Toward the end of the field period (September 29, 2017), the incentive was increased to $10 to foster participation of the harder-to-reach respondents. A total of 187 respondents were offered the $10 incentive.

Screening and Child Selection

Respondents qualified for the study if they were the parent or guardian of a child aged 3 to 6 living in their household. For eligible respondents with more than one child in this age range, one child was randomly selected to be the referenced child for specific questions in the survey.

Weighting Procedures

This study was weighted to provide nationally representative and projectable estimates of parents of children aged 3 to 6. The data were weighted in four stages.

1. **Recontact Propensity Correction (Wp).** This adjustment accounts for the potential bias associated with recontacting respondents.

   All respondents were recontacted on the basis of their participation in a previous survey, the SSRS Omnibus. Inverse Probability Weighting (IPW), or Propensity Weighting, is typically used to adjust for attrition in longitudinal studies. Characteristics of the respondents as measured in the initial study are used to model the respondents' propensity to respond to the recontact survey.

   The predictive values from the logistic regression model were used as the probability of a person completing the recontact survey. Predictors included age, gender, home ownership, employment status, race, education, registered-to-vote status, income, and cell phone use. The inverse of this probability was used as the propensity weight. As such, higher propensity weights correspond to respondents who have a lower probability of responding to the recontact survey.

2. **Total Probability of Selection Weight (Wps).** The Propensity Weight (Wp) from step one was then multiplied by the Total Probability of Selection Weight (Wps) from the original SSRS Omnibus study. The process to calculate the Wp is outlined below.

   SSRS Omnibus Baseweight. The original SSRS Omnibus respondents were weighted to provide nationally representative and projectable estimates of the adult population 18 years of age and older. The weighting process takes into account the disproportionate probabilities of household and respondent selection due to the number of separate telephone landlines and cellphones answered by respondents and their households, as well as the probability associated with the random selection of an individual household member.

   A. Probability of Selection (P_{phone}). A phone number's probability of selection depends on the number of phone numbers selected out of the total sample frame. So, for each respondent whose household has a landline phone number, this is calculated as total landline numbers dialed divided by total numbers in the landline frame, and conversely, for respondents answering at least one cell phone number, this is calculated as total cell phone numbers divided by total numbers in the cell phone frame.

   B. Probability of Contact ($P_{contact}$). The probability that the sampling unit (households on landlines or respondents on cell phone) will be reached is a product of the number of phones (by type) that a respondent or their household answer.

   C. Probability of Respondent Selection (P_{select}). In households reached by landline, a single respondent is selected. Thus, the probability of selection within a household is inversely related to the number of adults in the household.

Total Probability of Selection. This is calculated as the phone number's probability of selection (by frame), multiplied by the number of devices of each type the respondent answers, and, for landlines, divided by the number of adults in the household.[3] Thus, for each respondent a probability can be calculated for being reached via landline (LL_{prob}) and for being reached via cell phone ($Cell_{prob}$). These calculations are

$$LL_{prob}=P_{phone}*P_{contact}*P_{select}$$

$$Cell_{prob}=P_{phone}*P_{contact}$$

The sample weights derived at this stage are calculated as the inverse of the combined probability of selection, or

$$1/(LL_{prob}+Cell_{prob}-LL_{prob}*Cell_{prob})$$

3. To avoid extremely large or small weights, the maximum number of devices for each type of phone and the maximum number of adults was capped at three.

3. **Post-Stratification Weighting.** With the base-weight applied, the sample underwent the process of iterative proportional fitting (IPF), in which the sample was balanced to match known population parameters for households with children ages 3–6 based on data from the U.S. Census Bureau's 2015 American Community Survey. This process of weighting was repeated until the root mean square error for the differences between the sample and the population parameters was 0 or near-zero.

   The population parameters used for post-stratification are: age (18–29; 30–49; 50–64; 65+) by gender; census region (Northeast, North-Central, South, West); education (less than high school, high school graduate, some college, four-year college or more); and race/ethnicity (white non-Hispanic; black non-Hispanic; Hispanic; other non-Hispanic).

   This adjustment was implemented separately for the income less than $50,000 (LT50K) group and the greater than or equal to $50,000 (GE50K) group. Weights were decreased and or increased as necessary so that the share of the two income groups reflected the distribution of 59.8% for the GE50K group and 40.2% LT50K in the ACS 2015 data.

4. **Weight Truncation ("Trimming").** To reduce variance caused by extremely large weights, the weights were truncated to top/bottom 2%.

Table 3: Weighting Parameters

	Income greater than or equal to $50k	Income less than $50k
Gender by Age		
M 18–29	4.3%	7.7%
M 30–49	42.7%	23.4%
M 50–64	5.5%	2.9%
M 65+	1.3%	.8%
F 18–29	5.9%	24.2%
F 30–49	35.1%	35.5%
F 50–64	4.1%	4.0%
F 65+	1.1%	1.5%
Education		
Less than High School	6.4%	23.7%
High School Graduate	16.2%	30.8%
Some College	29.8%	34.5%
College+	47.7%	11.0%
Region		
Northeast	17.3%	13.9%
North Central	22.0%	20.6%
South	35.5%	42.6%
West	25.2%	22.8%
Race		
White	64.6%	40.2%
African American	8.8%	21.3%
Hispanic	16.4%	32.1%
Other	10.2%	6.4%

Margin of Error and Design Effect

Weighting procedures increase the variance in the data, with larger weights causing greater variance. Complex survey designs and post-data collection statistical adjustments affect variance estimates and, as a result, tests of significance and confidence intervals. Design effect for this survey was 1.8 overall. Accounting for sample size and design effect, the margin of sampling error for this study in total is +/-3.5 percentage points at a 95% confidence level.

Weights were normalized such that the sum of weights equals the un-weighted number of completed interviews.

Table 4: Margin of Error and Design Effect

	N	Design Effec (DEFF)	MOE with DEFF %
Total	1442	1.8	3.5
Income greater than or equal to $50k	533	1.5	5.2
Income less than $50k	909	1.5	3.9

Survey Data Analyses

Researchers analyzed survey data using SAS and STATA 15.0. Primary analyses were simple frequencies, applying sampling weights to account for the probability of selection. Exploratory subgroup analyses were conducted for family income, parents' educational attainment, parent gender, and child age, in which the means for each group were calculated, with sampling weights applied. The statistical significance of the subgroup differences was probed using linear regression, weighted for the probability of selection.

Qualitative Study

Sample and Recruitment

In order to better understand parent thinking, rationale, and engagement in learning with their children, researchers recruited research participants in three regions of the U.S., including an urban, a surburban, and a rural location—Jackson, Mississippi; Two Rivers, Illinois and Cookeville, Tennessee. Data collection activities included eight focus groups with a total of 65 families and two home visits with 11 families (selected from focus group participants).

Focus group participants were recruited by researchers (in Illinois), and with the help of local PBS station staff (in Tennessee and Mississippi). In Illinois, participating families all had young children in a local Head Start early learning program. In Tennessee, families were recruited with the help of WCTE Upper Cumberland PBS and a local after-school program partner. In Mississippi, families were recruited with the help of Mississippi Public Broadcasting (MPB) and MPB partner, Springboard to Opportunities. With one exception—a woman who lived nearby—all study participants in Mississippi were residents of one of two public housing complexes.

Researchers screened interested families by phone ahead of focus groups to ensure each had at least one child aged 3 to 6 living at home. Because of the study focus on the experiences of low-income families, families were also screened for an annual household income of less than $50,000. Following the focus groups, home visit participants volunteered for a follow-up visit and then were selected by researchers to ensure a variety of comfort with science and the use of digital media for learning.

Data Collection

Researchers conducted eight focus groups with 65 families and two home visits spaced two or three weeks apart with 10 families. One additional family included in the first round of home visits was not available for a second home visit. Focus group and home visit data were collected between October 16 and December 6, 2017.

Researchers used a different semi-structured interview protocol for each phase. The focus group protocol probed for parents' current ideas about their role in helping their children learn; the skills and learning domains they believe are most important to impart to their young children at home; learning activities they do with their children; the challenges parents face in regard to their children's learning and supports they would like; and the educational media they and their children use regularly. The first home visit protocol focused on gathering similar information about specific families, as well as expounding on the challenges they face and resources they would most want.

Because parents' perceptions of the ways they help children learn tend to focus on more formal learning opportunities and our interest was in understanding the widest possible opportunities for engagement in learning, the home visit interview protocols started by asking parents to describe typical weekday and weekend routines when parents spend the most time with their child, to identify a recent experience during one of those typical routines, and to describe the learning the parent might have helped their child with during that time. In addition, researchers asked parents about special learning opportunities or experiences they engaged in with their children. Researchers also asked parents to talk about the devices and digital media their child used most often and whether and how it related to their learning. During the two or three weeks between home visits, researchers asked families to document typical science-related learning activities that they did with their children by texting or emailing pictures, videos, and/or short messages to researchers. The second home visit focused particularly on science learning, and included a discussion about the science-related texts and emails as well as an observation of families engaging with a short, researcher-provided science-related video and iPad game.

Data Analysis of Focus Groups, Interviews, and Observations

The approach to analysis roughly followed the Sort and Sift, Think and Shift method, with special focus on the data inventory, categorization, bridging, and data presentation phases (Curry, Nembhard, & Bradley, 2009; Fryer et al., 2016; Maietta, 2006). All interviews were digitally recorded and transcribed. Researchers also completed episode summaries after each data collection event based on their notes and the transcriptions, taking care to keep inferences and impressions documented separately. Researchers created a matrix that summarized the episode summaries by domains aligned to the research questions. After diving into the episode summaries and data matrix, the qualitative research team stepped back to generate a list of propositions about the data (Miles, Huberman, & Saldana, 2013) and developed a coding scheme to test and confirm our initial set of propositions. The team then developed a coding scheme through an iterative process that began with constructing a set of base codes grounded in the propositions and prior similar research studies, then using these codes during an initial review of data. Through this process, new codes

were identified and constructed to appropriately represent the core themes noted in the data. Once this development process was complete, five members of the qualitative research team divided up the families of codes and applied the coding scheme to all transcripts using the qualitative and mixed methods application Dedoose. This process yielded coded excerpts that researchers culled for representative quotes and specific evidence.

For the purposes of this report, we have polished the syntax of the quotes we use to enhance readability. We have also removed the interviewer's dialogue and have consolidated quotes from a conversation while maintaining meaning, when appropriate, including reordering some statements within longer quotations.

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Appendix B: Parent Survey

SCREENER

LANDLINE INTRO:

(ASK IF LL SAMPLE)

LINTRO1.

Hello. My name is _____ and I'm calling on behalf of the Education Development Center, a nonprofit research organization. This phone survey is part of a research project for PBS KIDS and the Corporation for Public Broadcasting.

The goal of this survey is to learn more about how parents support children's learning at home. Eligible participants will be sent $5 or a $5 Amazon gift code at the end of the survey.

[IF ASKED: This interview takes about 20 minutes or less. Your telephone number was randomly selected].

[IF NECESSARY: This is NOT a sales or fundraising call.]

[IF NECESSARY: Your responses are confidential, and will not be shared with anyone outside the research team.]

[IF NECESSARY: The data collection for this study is being conducted by SSRS, a research company that specializes in public opinion research.]

(CONTINUE TO INTRO2)

CELLPHONE INTRO

(ASK IF CELL SAMPLE)

CINTRO1.

Hello. My name is _____ and I'm calling on behalf of the Education Development Center, a nonprofit research organization. This phone survey is part of a research project for PBS KIDS and the Corporation for Public Broadcasting.

The goal of this survey is to learn more about how parents support children's learning at home. Eligible participants will be sent $5 or a $5 Amazon gift code at the end of the survey. Before we continue, are you driving?

[IF ASKED: This interview takes about 20 minutes or less. Your telephone number was randomly selected].

[IF NECESSARY: This is NOT a sales or fundraising call.]

[IF NECESSARY: Your responses are confidential, and will not be shared with anyone outside the research team.]

[IF NECESSARY: The data collection for this study is being conducted by SSRS, a research company that specializes in public opinion research.]

1 Not driving	GO TO INTRO2
2 Driving	SET UP CALLBACK
3 (DO NOT READ) This is NOT a cell phone	THANK & TERM
R (DO NOT READ) Refused	THANK & TERM

(ASK ALL)
(INSERT INTERVIEWER NOTE IF LANDLINE)

INTRO2. Could you please tell me if you are 18 or older?
(IF UNDER 18: May I please speak with an adult 18 or older living in this household?)

1 Under 18	THANK & TERM
2 18 or older	GO TO S1
R REFUSED	THANK & TERM

(ASK ALL)

S1. First, including yourself, how many people are there living in your household?
(RECORD SINGLE DIGIT NUMBER)

_____	[IF 1 THANK & TERM]
8 Eight or more people	
9 Refused	THANK & TERM

(ASK IF MORE THAN 1 PERSON S1>1)

S2. How many of these are children, under age 18?
(RECORD SINGLE DIGIT NUMBER)

_____ (0-7)	[IF 0 THANK & TERM]
8 Eight or more children	
9 Refused	THANK AND TERM

(ASK IF ANY CHILDREN S2>0)

S3. Are you the parent or guardian of any child age 3 to 6 living in your household?

1 Yes	
2 No	IF CELL PHONE, THANK & TERM; IF LANDLINE ASK S4
9 (DO NOT READ) Refused	THANK & TERM

(ASK IF LANDLINE, MORE THAN 1 PERSON, AND NOT A PARENT (IF LL AND S1>1 AND S3=2)

S4. Is there anyone else living there who is the parent or guardian of a child age 3 to 6 living in your household?

1 Yes, available now	ASK TO SPEAK WITH, GO TO LINTRO1
2 Yes, not available right now	SET UP CALLBACK
3 No, no one in household is parent/guardian of child age 3-6	THANK & TERM
R Refused	THANK & TERM

(ASK IF PARENT OF CHILD 3-6 -S3 = 1)

S5. How many children age 3 to 6 do you have?

_____ (RECORD NUMBER 1-10)	
NN None	THANK & TERM
RR (DO NOT READ) Refused	THANK & TERM

(ASK IF HAS CHILD 3-6 – S5>0)

S6. Now, what is your age?

_____ (RANGE 18-97)	
NN (DO NOT READ) Under 18	THANK & TERM
RR (DO NOT READ) Refused	

(ASK IF S6=RR)

S7. Could you please tell me if you are ...?
(READ LIST)

0 (IF UNDER 18)	THANK & TERM
1 18-24	
2 25-29	
3 30-49	
4 50-64	
5 65+	
R (DO NOT READ) Refused	THANK & TERM

(ASK IF HAS CHILD 3-6 – S5>0

S8. Was the total income of all persons in your household over the past year more than or less than $50,000? (READ IF NEEDED: Please include salaries or other earnings, interest, retirement, and so on for all household members in your response.)

[INTERVIEWER NOTE: If R says exactly $50,000. Code as 1 'more than $50k']

1 More than $50,000
2 Less than $50,000
8 (DO NOT READ) Don't know THANK & TERM
9 (DO NOT READ) Refused THANK & TERM

(ASK IF HAS CHILD 3-6 – S5>0)

SEX. Record SEX of Respondent:

(INTERVIEWER NOTE: OBSERVATION ONLY, ASK ONLY IF UNCERTAIN)

1 Male
2 Female

(ASK IF HAS CHILD 3-6 – S5>0)

SEL 1. [IF MORE THAN ONE CHILD AT S5 SHOW: Since you have more than one child in the 3 to 6-year-old age range, please select the child whose first name comes first in the alphabet, and focus your responses around this child.]

Let's start with a few basic questions.

(ASK IF HAS CHILD 3-6 – S5>0)
(PN: HIDE THIS Q ADDED IN, IN CASE SELECTION CRITERIA CHANGES)

SEL 2. [IF MORE THAN ONE CHILD AT S5 SHOW: Since you have more than one child in the 3 to 6-year-old age range, please select the child who is the youngest, and focus your responses around this child.]

Let's start with a few basic questions.

(ASK IF HAS CHILD 3-6 – S5>0)

CHILD AGE.

[IF S5=1 SHOW: For your child age 3-6, what is their month and year of birth?]

[IF S5>1 SHOW: What is this child's month and year of birth?]

[If date of birth indicates that child is outside of the 3 to 6 age range, ask parent to select another child. If no other child falls within target age range, terminate interview.]

[IF NEEDED: If you have more than one child age 3 to 6, please think of the one whose first name comes first in the alphabet. [(PN: HIDE THIS INSTRUCTION – ONLY TO BE ADDED IF SELECTION CRITERIA CHANGES IN SEL2: IF NEEDED If you have more than one child in the 3 to 6 year-old age range, please think of the one who is the youngest.)]

1 Month given (RANGE 01-12)
2 Year given (RANGE 2010-2014)
9 (DO NOT READ) Refused THANK & TERM

(PN: CHILD AGE NEEDS TO BE 09/2010 – 09/2014 TO MOVE FORWARD IN SURVEY. IF CHILD AGE FALLS OUTSIDE THIS RANGE PLEASE REASK CHILD AGE)

(ASK IF HAS CHILD 3-6 – S5>0)

CHILD GENDER. Is this child male or female?

1 Male
2 Female
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

(PN: IF INELGIBLE OR OQ THANK AND TERM, ALL ELIGIBLE PARENTS OF A CHILD AGE 3-6 CONTINUE.)

PROGRAMMER QUOTA CHECK:

» TARGET CHILD GENDER = CHILDGEN

» TARGET CHILD AGE = CHILDAGE

- (IF CHILD GENDER=1 AND CHILD AGE=3 OR 4 [**QUOTA=375**]) – MALE AGE 3 OR 4
- (IF CHILD GENDER=2 AND CHILD AGE=3 OR 4 [**QUOTA=375**]) – FEMALE AGE 3 OR 4
- (IF CHILD GENDER=1 AND CHILD AGE=5 OR 6 [**QUOTA=375**]) – MALE AGE 5 OR 6
- (IF CHILD GENDER=2 AND CHILD AGE=5 OR 6 [**QUOTA=375**]) – FEMALE AGE 5 OR 6

» PARENT INCOME = S8

- (IF S8=1 [**QUOTA=500**]) – INCOME GREATER THAN $50,000
- (IFS8=2 [**QUOTA=1000**]) – INCOME LESS THAN $50,000

INCOME AND CHILDGEN/CHILDAGE QUOTAS ARE SEPARATE

MAIN STUDY

[NOTE: no Q1 or Q2]

[QUALIFIED RESPONDENTS ONLY FOR REST OF SURVEY]

(ASK ALL)

Q3. Would you share this child's first name with us? I will only use this so I can refer to [IF QCHILD GENDER=1 INSERT: him, IF QCHILD GENDER=2 INSERT her, IF QCHILD GENDER=8 or 9 INSERT your child] by name in this survey.

[IF NEEDED: If you are more comfortable, you could just give me [IF QCHILD GENDER=1 INSERT: his, IF QCHILD GENDER=2 INSERT her, IF QCHILD GENDER=8 or 9 INSERT your child's] initials or a nickname.]

1 Answer given
9 (DO NOT READ) Refused

FAMILY COMPOSITION

(ASK ALL)
(RANDOMIZE CODES 1-3)
(CODE 5,8,9 SB UNIQUE CODES)

Q4. We have listed that you and [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT: your child] currently live in the same household. Which other adults, if any, live with you in your home?

(INTERVIEWER NOTE: READ LIST. SELECT ALL THAT APPLY.)

1 Spouse or partner
2 Child's grandparents
3 Other adult relatives
4 Other adults (not relatives)
5 (DO NOT READ) No other adults live in your home
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

EARLY LEARNING

(ASK ALL)
(READ: Next, I'd like to ask about your thoughts on your child's learning.)

ATTITUDES AND BELIEFS ABOUT EARLY LEARNING

(ASK ALL)
(RANDOMIZE a-c)

Q6. I am going to read you three statements about your role in [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT: your child]'s learning. For each statement, please tell me if you strongly agree, agree, disagree, or strongly disagree. First, (INSERT ITEM). Do you (READ LIST)?

How about (INSERT ITEM)?

(INTERVIEWER NOTE: READ SCALE AS NECESSARY.)

4 Strongly Agree
3 Agree
2 Disagree
1 Strongly Disagree
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

a. You want to be involved in your child's education.

b. You don't have to worry about your child's learning, because [IF QCHILD GENDER=1 INSERT: he, IF QCHILD GENDER=2 INSERT she], IF QCHILD GENDER=8 or 9 INSERT your child] will learn everything [IF QCHILD GENDER=1 INSERT: he, IF QCHILD GENDER=2 INSERT she, IF QCHILD GENDER=8 or 9 INSERT your child] needs to know in school.

c. You prioritize having fun with your child at home without being concerned if it is educational or not.

(READ TO ALL: I am going to read you a few more statements about [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT your child]'s learning in school. If your child is not in school yet, please describe what you expect to happen once your child starts school.)

(ASK ALL)
(ROTATE ITEMS 1-2)

Q7. Who do you think is most responsible for teaching your child about social skills, like sharing and being patient? Would you say…?

(INTERVIEWER NOTE: READ LIST)

1 You as a parent are most responsible
2 Your child's school is most responsible

OR

3 You and your child's school are equally responsible
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

(ASK ALL)
(ROTATE ITEMS 1-2 SAME ORDER AS Q7)

Q8. Who do you think is most responsible for teaching your child academic skills like reading, writing, and mathematics? Would you say…? (READ LIST)

1 You as a parent are most responsible
2 Your child's school is most responsible

OR

3 You and your child's school are equally responsible
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

PARENTS' SUPPORT OF EARLY LEARNING

(ASK ALL)
(RANDOMIZE a-e)

Q10. I'd like to ask you about activities you do with [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT your child], and how often you do them. In the last month, how often have you (INSERT ITEM)? (READ LIST)

How often have you (INSERT ITEM)?

(INTERVIEWER NOTE: READ SCALE AS NECESSARY.)

1 Daily
2 Once or twice a week
3 Once or twice this past month
4 Did not do this past month
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

a. Played games or completed puzzles with [IF QCHILD GENDER= 1 INSERT him, IF QCHILD GENDER=2 INSERT her, IF QCHILD GENDER= 8 OR 9 INSERT: your child]?

b. Done arts and crafts with [IF QCHILD GENDER= 1 INSERT him, IF QCHILD GENDER=2 INSERT her, IF QCHILD GENDER= 8 OR 9 INSERT: your child]?

c. Involved [IF QCHILD GENDER= 1 INSERT him, IF QCHILD GENDER=2 INSERT her, IF QCHILD GENDER= 8 OR 9 INSERT: your child] in household chores (READ IF NEEDED: like cooking, cleaning, setting the table, and caring for pets)?

d. Sung songs or played musical instruments with [IF QCHILD GENDER= 1 INSERT him, IF QCHILD GENDER=2 INSERT her, IF QCHILD GENDER= 8 OR 9 INSERT: your child]?

e. Played a sport or done exercise with [IF QCHILD GENDER= 1 INSERT him, IF QCHILD GENDER=2 INSERT her, IF QCHILD GENDER= 8 OR 9 INSERT: your child]?

(ASK ALL)
(RANDOMIZE a-d)

Q11. I'd like to ask you about a few more activities, and how often you have done them with [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT: your child]. In the last month, how often have you (INSERT ITEM)? (READ LIST)

How often have you (INSERT ITEM)?

(INTERVIEWER NOTE: READ SCALE AS NECESSARY.)

1 Daily
2 Once or twice a week
3 Once or twice this past month
4 Did not do this past month
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

a. Read or told stories to [IF QCHILD GENDER= 1 INSERT him, IF QCHILD GENDER=2 INSERT her, IF QCHILD GENDER= 8 OR 9 INSERT: your child]?

b. Worked on reading or writing skills with [IF QCHILD GENDER= 1 INSERT him, IF QCHILD GENDER=2 INSERT her, IF QCHILD GENDER= 8 OR 9 INSERT: your child]?

c. Worked on learning numbers, shapes or other math concepts with [IF QCHILD GENDER= 1 INSERT him, IF QCHILD GENDER=2 INSERT her, IF QCHILD GENDER= 8 OR 9 INSERT: your child]?

d. Watched educational TV shows or videos or played with educational digital games or apps with [IF QCHILD GENDER= 1 INSERT him, IF QCHILD GENDER=2 INSERT her, IF QCHILD GENDER= 8 OR 9 INSERT: your child]?

EARLY SCIENCE LEARNING

(ASK ALL)
(READ: We've been talking about your child's learning more broadly, but now I would like to turn specifically to science learning.)

(ASK ALL)

Q12. In a few words, what science learning activities does your child like to do?

97 Answer given
98 (DO NOT READ) Don't know
99 (DO NOT READ) Refused

ATTITUDES AND BELIEFS ABOUT EARLY SCIENCE LEARNING

(ASK ALL)

Q13. At what age do you think children should start learning science? When they are (READ LIST)?

1 Infants
2 1-2 years old
3 3-4 years old
4 5-7 years old
5 Older than 7
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

(ASK ALL)
(RANDOMIZE a-c)

Q14. I am going to list a few subjects. For each, please tell me how important it is for you to help [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT: your child] learn these things at home. How important is it for you to (INSERT ITEM)? Is it (READ LIST)?

And, how important is it for you to (INSERT ITEM)?

(INTERVIEWER NOTE: READ SCALE AS NECESSARY.)

3 Very important
2 Important
1 Not important
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

a. Help [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT your child] learn to read and write at home? (PN: IF Q14a=2 OR 3 ASK Q15a IMMEDIATELY FOLLOWING Q14a.)

b. Help [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT your child] learn math at home? (IF Q14b=2 OR 3 ASK Q15b IMMEDIATELY FOLLOWING Q14b.)

c. Help [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT your child] learn social skills at home, such as cooperation and self-control? (IF Q14c=2 OR 3 ASK Q15c IMMEDIATELY FOLLOWING Q14c.)

(ASK CORRESPONDING Q15 IMEDIATELY FOLLOWING Q14 IF RESPONSE=2 OR 3)
(ASK AS FOLLOW UP IMMEDIATELY AFTER Q14a)
(ASK Q15a IF Q14a=2 OR 3)

Q15a. Is helping [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT your child] learn to read and write at home more important, as important, or less important than science learning?

1 More important than science
2 As important as science
3 Less important than science
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

(ASK AS FOLLOW UP IMMEDIATELY AFTER Q14b)
(ASK Q15b IF Q14b=2 OR 3)

Q15b. Is helping [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT your child] learn math at home more important, as important, or less important than science learning?

1 More important than science
2 As important as science
3 Less important than science
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

(ASK AS FOLLOW UP IMMEDIATELY AFTER Q14c)
(ASK Q15c IF Q14c=2 OR 3)

Q15c. Is helping [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT your child] learn social skills at home more important, as important, or less important than science learning?

1 More important than science
2 As important as science
3 Less important than science
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

(ASK ALL)
(RANDOMIZE a-g)

Q16. How often have you done the following activities with [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT your child] at home or in your community? In the last month, how often have you (INSERT ITEM)? (READ LIST)

How often have you (INSERT ITEM?

(INTERVIWER NOTE: READ LIST AS NECESSARY)

1 Daily
2 Once or twice a week
3 Once or twice this past month
4 Did not do this past month
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

a. Read about nature or science in books or magazines with [IF QCHILD GENDER=1 INSERT: him, IF QCHILD GENDER=2 INSERT her, IF QCHILD GENDER=8 OR 9 INSERT: your child]

b. Built something with [IF QCHILD GENDER=1 INSERT: him, IF QCHILD GENDER=2 INSERT her, IF QCHILD GENDER=8 OR 9 INSERT: your child] (READ IF NEEDED: such as a tower with blocks, a model airplane, etc.)

c. Played with a science-related puzzle or board game with [IF QCHILD GENDER=1 INSERT: him, IF QCHILD GENDER=2 INSERT her, IF QCHILD GENDER=8 OR 9 INSERT: your child] (READ IF NEEDED: such as one involving plants or animals)

d. Explored science in the outdoors with [IF QCHILD GENDER=1 INSERT: him, IF QCHILD GENDER=2 INSERT her, IF QCHILD GENDER=8 OR 9 INSERT: your child] (READ IF NEEDED: such as observing animals, insects, plants, or the weather)

e. Explored science in everyday activities with [IF QCHILD GENDER=1 INSERT: him, IF QCHILD GENDER=2 INSERT her, IF QCHILD GENDER=8 OR 9 INSERT: your child] (READ IF NEEDED: such as noticing what sinks and floats, mixing colors, or talking about freezing and melting)

f. Visited a science place with [IF QCHILD GENDER=1 INSERT: him, IF QCHILD GENDER=2 INSERT her, IF QCHILD GENDER=8 OR 9 INSERT: your child] (READ IF NEEDED: such as a zoo, pet store, community garden, aquarium, nature center, or museum)

g. Watched science-related educational television shows or videos or played with science-related educational digital games or apps with [IF QCHILD GENDER=1 INSERT: him, IF QCHILD GENDER=2 INSERT her, IF QCHILD GENDER=8 OR 9 INSERT: your child]

(ASK ALL)
(RANDOMIZE a-d)

Q17. I'm going to read a list of skills. Please tell me if you feel very confident, somewhat confident, or not confident about helping your child learn these skills. If you're unsure of what these skills are, please say "I am unsure of what the skills are." How confident do you feel about helping [IF Q3=1 INSERT: CHILD NAME, IF Q3=2 INSERT your child] learn (INSERT ITEM)? Would you say (READ LIST.)

How about (INSERT ITEM)?

(INTERVIEWER NOTE: READ LIST AS NECESSARY.)

1 You feel very confident
2 You feel somewhat confident
3 You don't feel confident
4 You are unsure of what the skills are
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

a. Age-appropriate reading and writing skills

b. Age-appropriate math skills

c. Age-appropriate behavioral, social and emotional skills

d. Age-appropriate science skills

(ASK ALL)
(RANDOMIZE a-f)

Q18. We are interested in what kinds of things might make it easier for you to help [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT your child] learn science at home. How much, if at all, would each of these help your family do more science at home? First, (INSERT ITEM)? Would this help a lot, a little, or not at all?

Next, (INSERT ITEM)?

(INTERVIEWER NOTE: READ SCALE AS NECESSARY.

1 A lot
2 A little
3 Not at all
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

a. Would having information about what [IF QCHILD GENDER=1 INSERT he, IF QCHILD GENDER=2 INSERT she, IF QCHILD GENDER=8 OR 9 INSERT: your child] should learn about science help your family do more science at home?

b. Would having ideas for science activities to do with [IF QCHILD GENDER=1 INSERT: him, IF QCHILD GENDER=2 INSERT: her, IF QCHILD GENDER=8 OR 9 INSERT: your child] help your family do more science at home?

c. Would having ideas for doing science with everyday materials help your family do more science at home?

d. Would having better access to technology such as a computer, smartphone or an Internet connection help your family do more science at home?

e. Would having ways to get yourself more interested in or excited about science help your family do more science at home?

f. Would having ways to get [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT Your child] more interested in science help your family do more science at home?

MEDIA USE FOR LEARNING

(ASK ALL)
(READ: The next set of questions concerns educational media, that is, TV shows, videos, games, and apps that teach your child something.)

FREQUENCY OF EDUCATIONAL MEDIA USE

(ASK ALL)
(RANDOMIZE a-c)

Q19. In the past month, has [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT your child] ever done any of the following at home? You can say yes, no, or I don't know.

Has [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT your child] (INSERT ITEM)?

1 Yes
2 No
8 Don't know
9 (DO NOT READ) Refused

a. Watched educational TV shows and videos (READ IF NEEDED: including DVDs or online videos like YouTube, viewed on a computer, smartphone, or tablet.)

b. Played digital learning games or apps (READ IF NEEDED: including games and apps played on the computer, smartphone, iPhone, iPad, Leap Pad, or tablet.)

c. Visited websites to get information or learn something, either independently or with an adult

(ASK ALL)
(RANDOMIZE a-g)

Q20. How do you typically find educational videos, games, and apps for [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT your child]? I'm going to read a list of options. For each option, please say whether you use it often, sometimes, rarely, or never to find educational videos and games.

How often do you use (INSERT ITEM) to find educational videos and games?

(INTERVIEWER NOTE: READ SCALE AS NECESSARY.)

1 Often
2 Sometimes
3 Rarely
4 Never
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

a. Recommendations from your family members or friends

b. Recommendations from school or teachers

c. Recommendations from a library, museum or community organization such as the YMCA

d. Social media websites, such as Facebook, Pinterest or Instagram

e. TV networks that you know and trust

f. Searches on the internet, such as using Google, YouTube, App store, or Google Play

g. Recommendations or reviews of educational shows, online games or apps in newspapers, magazines or websites like common sense media.

ATTITUDES TOWARDS EARLY MEDIA USE

(ASK ALL)
(RANDOMIZE a-i)

Q21. We are curious about how much children learn about various topics from media, such as television shows or videos, digital games, and apps. For each of the following topics, please say whether [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT your child] has learned a lot, some, only a little, or nothing from media. If you think it is not appropriate for [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT your child]'s age to learn about some topics from media, please say "not appropriate for my child's age".

First, would you say your child has learned a lot, some, only a little, or nothing about [INSERT ITEM] from media?

How about [INSERT ITEM]?

[READ AS NEEDED: Would you say your child has learned a lot, some, only a little, or nothing about [INSERT ITEM] from media?]

1 A lot
2 Some
3 Only a little
4 Nothing
5 Not appropriate for my child's age
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

a. Math

b. Science

c. Reading or vocabulary or new words

d. Social skills or behavior like cooperation, self-control, how to share, or empathy

e. Music or art

f. Healthy habits like healthy eating or hand-washing

g. Other languages that are not English

h. Problem solving or critical thinking

i. Information about people and the community around [IF QCHILD GENDER=1 INSERT: him, IF QCHILD GENDER=2 INSERT her, IF QCHILD GENDER=8 OR 9 INSERT your child.]

USE OF MEDIA FOR SCIENCE LEARNING

(ASK ALL)
(RANDOMIZE a-c)

Q22. The following statements focus on how often [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT: your child] watches science-related television or videos or plays science-related digital games or apps. In the past month, how often has [IF QCHILD GENDER=1 INSERT: he, IF QCHILD GENDER=2 INSERT she, IF QCHILD GENDER=8 OR 9 INSERT your child] (INSERT ITEM)? (READ LIST)

How about (INSERT ITEM)?

(INTERVIEWER NOTE: READ SCALE AS NECESSARY.)

1 Daily
2 Once or twice a week
3 Once or twice this past month

4 Did not do this past month
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

a. Watched TV shows and videos about science? (READ IF NEEDED: Including any science shows your child watched, such as cartoons about science or nature shows that are for kids or adults)

b. Played with video games or apps about science

c. Visited websites to get information or learn something about science

FAMILY MEDIA PATTERNS AND SUPPORT FOR EARLY SCIENCE LEARNING

(ASK ALL)
(RANDOMIZE a-f)

Q23. For these questions please think specifically about science learning. In the past month, how often did you (INSERT ITEM)? (READ LIST)

And, how often did you (INSERT ITEM)?

(INTERVIEWER NOTE: READ SCALE AS NECESSARY)

1 Daily
2 Once or twice a week
3 Once or twice this past month
4 Did not do this past month
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

a. Monitor [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT: your child]'s viewing and playing (READ IF NEEDED: such as what they are watching or playing or for how long)

b. Help [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT: your child] access and play a show, app, or game

c. Watch a show or play a game or app along with [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT: your child]

d. Explain or talk about something that you're watching or playing

e. Talk about connections between a show, app, or game and things you do in your daily life

f. Compliment or encourage [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT: your child] (READ IF NEEDED: such as when [IF QCHILD GENDER=1 INSERT: he, IF QCHILD GENDER=2 INSERT she, IF QCHILD GENDER=8 OR 9 INSERT your child.] wins part of a game, creates something interesting or uses a device well)

(ASK ALL)

Q24. Are you satisfied with the kinds of TV shows, games, apps or websites currently available to help [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT: your child] learn science? Would you say you are… (READ LIST)?

1 Satisfied
2 Not satisfied
3 Or do you have no opinion
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

FAMILY DEMOGRAPHICS/ CHARACTERISTICS

(READ TO ALL: I have a few final questions about [IF Q3=1 INSERT: CHILD NAME, IF Q3=9 INSERT: your child]and your household.)

CHILD'S AGE AND SCHOOL STATUS

(ASK ALL)

D1. Is your child currently attending or about to start any of the following?

(READ LIST. SELECT ALL THAT APPLY.)

1 Daycare
2 Head Start
3 Other Pre-K program
4 Elementary school
5 Childcare is provided by family members, friends, or neighbors
6 Child is not enrolled in preschool or daycare
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

RACE AND ETHNICITY

(ASK ALL)

D2. Are you of Hispanic or Latino origin or descent?

1 Yes
2 No
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

(ASK ALL)
(PN: SINGLE RESPONSE)

D3. Do you consider yourself white, black or African American, Asian, Native American, Pacific Islander, mixed race or some other race?

(IF RESPONDENT SAYS HISPANIC ASK: Do you consider yourself a white Hispanic or a black Hispanic?)

(INTERVIEWER NOTE: CODE AS WHITE (1) OR BLACK (2). IF RESPONDENTS REFUSED TO PICK WHITE OR BLACK HISPANIC, RECORD HISPANIC AS "OTHER,")

(IF "OTHER" SAY: "I'm not referring to your nationality. I just want to know if you consider yourself white or black.")

(IF RESPONDENT WON'T PICK ONE, THEN ENTER CODE FOR "OTHER")

01 White
02 Black or African American
03 Asian/Chinese/Japanese
04 Native American/American Indian/Alaska Native
05 Native Hawaiian and Other Pacific Islander
06 Mixed
97 Other (SPECIFY)
98 (DO NOT READ) Don't know
99 (DO NOT READ) Refused

LANGUAGES SPOKEN INCLUDING PRIMARY HOME LANGUAGE

(ASK ALL)
(ASK IF CURLANG=1 [SURVEY BEING CONDUCTED IN ENGLISH])

D4a. Other than English, what languages are spoken in your home? (SELECT ALL THAT APPLY)

1 Spanish
7 Other (SPECIFY)
6 (DO NOT READ) No other language spoken/English only
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

(ASK IF CURLANG=2 [SURVEY BEING CONDUCTED IN SPANISH])

D4b. Other than Spanish, what languages are spoken in your home? (SELECT ALL THAT APPLY)

1 English
7 Other (SPECIFY)
6 (DO NOT READ) No other language/Spanish only
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

PARENT EMPLOYMENT STATUS

(ASK ALL)

D5. During the past week, did you work at a job for pay?

1 Yes
2 No
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

(ASK D6 IF D5=1)

D6. About how many total hours per week do you usually work for pay, counting all jobs?

_____ (1-100 HOURS)
0 (DO NOT READ) Less than 1 hour
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

(ASK D7 IF D5=2)

D7. How did you spend most of your time last week? Would you say …? (READ LIST)

01 Keeping house or caring for children
02 Going to school
03 Retired
04 Unable to work, or
97 Something else? (SPECIFY)
98 (DO NOT READ) Don't know
99 (DO NOT READ) Refused

PARENT EDUCATION

(ASK ALL)

D8. What is the highest level of school you have completed or the highest degree you have received?

(READ LIST IF NECESSARY)

(INTERVIEWER NOTE: Enter code 3-HS grad if Respondent completed training that did NOT count toward a degree)

(INTERVIEWER NOTE: Enter code 3-HS graduate if Respondent completed vocational, business, technical, or training courses after high school that did NOT count toward an associate degree from a college, community college or university (e.g., training for a certificate or an apprenticeship))

01 Less than high school (Grades 1-8 or no formal schooling)

02 High school incomplete (Grades 9-11 or Grade 12 with NO diploma)

03 High school graduate (Grade 12 with diploma or GED certificate)

04 Some college, no degree (includes community college)

05 Two-year associate degree from a college or university

06 Four-year college or university degree/Bachelor's degree (e.g., BS, BA, AB)

07 Some postgraduate or professional schooling, no postgraduate degree

08 Postgraduate or professional degree, including master's, doctorate, medical or law degree (e.g., MA, MS, PhD, MD, JD)

98 (DO NOT READ) Don't Know

99 (DO NOT READ) Refused

HOUSEHOLD INCOME

(READ TO ALL: Earlier we asked you about the total income of all persons in your household over the past year (READ IF NEEDED: including salaries or other earnings, interest, retirement, and so on for all household members.))

(ASK IF S8=2)

D9a. Was your total income of all persons in your household over the past year (READ LIST)?

1 Less than $25,000
2 $25,000 to less than $50,000
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

(ASK IF S8=1)

D9b. Was your total income of all persons in your household over the past year (READ LIST)?

1 $50,000 to less than $75,000
2 $75,000 to less than $100,000
3 $100,000 or more
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

(IF LANDLINE SAMPLE)

L1. Now thinking about your telephone use. Does anyone in your household including yourself, have a working cell phone?

1 Yes respondent or someone else has cell phone in household
2 No
8 (DO NOT READ) Don't Know
9 (DO NOT READ) Refused

(IF CELL PHONE SAMPLE)

C1. Now thinking about your telephone use, is there at least one telephone INSIDE your home that is currently working and is NOT a cell phone?

1 Yes, has a home telephone
2 No, no home telephone
8 (DO NOT READ) Don't know
9 (DO NOT READ) Refused

(ASK IF CELL PHONE SAMPLE OR HH HAS A CELL PHONE (L1=1))

C1a. How many different cell phone numbers do you personally answer calls on?

_____ (ENTER # CELL PHONE NUMBERS; RANGE 0-7)

99 (DO NOT READ) Refused

(ASK IF LL SAMPLE OR HH HAS A LL PHONE (C1=1))

C3a. How many telephone numbers does your household have that I could have reached you on? Not extensions, but different telephone numbers, NOT counting cell phones?

_____ (ENTER # CELL PHONE NUMBERS; RANGE 1-7)
8 (DO NOT READ) 7 or more
9 (DO NOT READ) Don't know/No answer

(ASK ALL)

ZIP. And finally, what is your zipcode?

(INSTRUCTION: If "Don't Know" or "Refused" enter "99999")

_____ (00000 99998)
99999 (DO NOT READ) Don't know/Refused

(ASK IF ZIP9 = 99999)

State. In what State do you reside?

(DO NOT READ LIST)

_____ (LIST OF STATES)
RR (DO NOT READ) Refused

(ASK ALL)

INCENT1.

That completes the survey! Thank you for participating. We would like to send you $5 as a token of gratitude for your valuable time. Would you prefer us to mail the $5 to your postal address or send you an Amazon Gift Code by email?

1 Mail
2 Email
9 Refused incentive

(ASK IF INCENT1=1)

INCENT2

Can I please have your full name and a mailing address where we can send you $5?

(IF NECESSARY: We want to reassure you that your responses will be kept strictly confidential and your information will be kept in a separate file from the answers to the survey)

COLLECT AND ENTER RESPONDENT'S COMPLETE NAME AND MAILING

ONLY IF RESPONDENT WOULD LIKE TO RECEIVE COMPENSATION

(ASK ONLY IF RESPONDENT ACCEPTED INCENTIVE)

May I please have your name?
(VERIFY SPELLING)

1 Answer given (SPECIFY) _____
R (DO NOT READ) Refused

May I please have your address?
(VERIFY SPELLING)

1 Street: _____
2 City: _____
3 State: _____
4 Zip code:_____
R (DO NOT READ) Respondent does not want the money

(IF INCENT1=2)

INCENT3

Can I please have your email address where we can send the Amazon Gift Code for $5?

1 Email: _____@_____

(INTERVIEWER: READ BACK AND CONFIRM EMAIL ADDRESS)

1 Gave email address [RECORD EMAIL ADDRESS]
R (DO NOT READ) Refused email address

(READ TO ALL: Thank you very much for your time and input.)

[IF INCENT2=1: We will send you $5 by mail at the completion of the study. This should arrive in 4 to 6 weeks.]

[IF INCENT3=1: We will email you a $5 Amazon gift code within the next 2 weeks.]

(READ TO ALL: Have a great evening/day!)

Appendix C: Table of Results

Attitudes and Beliefs About Early Learning

Table C1

Parent Perceptions of the Role of Parents and School in Children's Education

	Parent wants to be involved child's education	Child will learn everything he/she needs to know in school
	Agree or strongly agree	
All respondents (%)	*n*=1442	*n*=1441
	99.1	14.8
Income status (%)	*n*=1412	*n*=1411
Annual income less than $25,000	99.1	32.4
Annual income $25,000–$50,000	99.3	18.3
Annual income $50,000–$75,000	99.6	10.1
Annual income $75,000–$100,0000	100.0	8.7
Annual income $100,000 or higher	98.2	6.8
Parent highest level of education (%)	*n*=1441	*n*=1434
Less than high school	99.0	38.5
High school	100.0	20.0
Some college	98.9	11.6
College graduate or higher	98.8	5.5
Parent gender (%)	*n*=1442	*n*=1441
Parent is male	98.6	13.1
Parent is female	99.5	16.2
Child age (%)	*n*=1442	*n*=1441
Three years old	99.5	20.9
Four years old	99.1	16.0
Five years old	98.4	12.0
Six years old	99.7	13.4

Table C2

Parent Reports of Who is Most Responsible for Teaching Child Social Skills

	Parent most responsible	School most responsible	Parent and school equally responsible
All respondents (%)	*n*=1439	*n*=1439	*n*=1439
	60.9	1.7	37.4
Income status (%)	*n*=1408	*n*=1408	*n*=1408
Annual income less than $25,000	45.3	1.1	53.6
Annual income $25,000–$50,000	61.9	1.1	37.1
Annual income $50,000–$75,000	69.4	1.8	28.8
Annual income $75,000–$100,0000	55.5	4.3	40.2
Annual income $100,000 or higher	66.3	.37	33.3
Parent highest level of education (%)	*n*=1437	*n*=1437	*n*=1437
Less than high school	52.6	1.6	45.8
High school	60.0	.23	39.8
Some college	56.2	2.7	41.0
College graduate or higher	69.2	1.5	29.3
Parent gender (%)	*n*=1439	*n*=1439	*n*=1439
Parent is male	66.3	1.6	32.1
Parent is female	56.4	1.7	41.9
Child age (%)	*n*=1439	*n*=1439	*n*=1439
Three years old	73.7	0.0	26.3
Four years old	60.3	.38	39.3
Five years old	58.6	1.9	39.5
Six years old	56.9	3.2	39.9

Table C3

Parent Reports of Who is Most Responsible for Teaching Child Academic Skills

	Parent most responsible	School most responsible	Parent and school equally responsible
All respondents (%)	*n*=1442	*n*=1442	*n*=1442
	8.9	15.5	75.7
Income status (%)	*n*=1412	*n*=1412	*n*=1412
Annual income less than $25,000	5.6	**14.0**	80.4
Annual income $25,000–$50,000	9.1	13.7	77.2
Annual income $50,000–$75,000	12.6	15.4	71.9
Annual income $75,000–$100,0000	7.6	18.0	74.4
Annual income $100,000 or higher	8.7	15.9	75.3
Parent highest level of education (%)	*n*=1441	*n*=1441	*n*=1441
Less than high school	5.1	16.7	78.2
High school	6.2	19.9	73.9
Some college	10.6	11.5	77.9
College graduate or higher	10.5	15.8	73.8
Parent gender (%)	*n*=1442	*n*=1442	*n*=1442
Parent is male	9.5	17.5	73.0
Parent is female	8.3	13.7	77.9
Child age (%)	*n*=1442	*n*=1442	*n*=1442
Three years old	11.7	11.6	76.7
Four years old	9.6	13.8	76.7
Five years old	7.0	15.9	77.1
Six years old	8.8	18.2	73.0

Table C4

Parent Reports About the Importance of Helping Their Children Learn at Home

	Help child learn social skills, such as cooperation and self-control	Help child learn to read and write	Help child learn mathematics
	Very important		
All respondents (%)	*n*=1441	*n*=1441	*n*=1441
	93.4	82.7	76.5
Income status (%)	*n*=1410	*n*=1412	*n*=1412
Annual income less than $25,000	91.3	86.4	75.4
Annual income $25,000–$50,000	94.3	85.5	79.6
Annual income $50,000–$75,000	92.3	79.6	72.9
Annual income $75,000–$100,0000	96.2	75.1	74.5
Annual income $100,000 or higher	92.4	85.7	79.2
Parent highest level of education (%)	*n*=1439	*n*=1440	*n*=1440
Less than high school	87.9	79.7	66.1
High school	93.1	85.7	76.2
Some college	95.3	82.6	79.4
College graduate or higher	94.0	81.9	77.8
Parent gender (%)	*n*=1440	*n*=1442	*n*=1442
Parent is male	93.1	81.7	76.3
Parent is female	93.7	83.5	76.6
Child age (%)	*n*=1440	*n*=1442	*n*=1442
Three years old	97.6	75.0	70.6
Four years old	92.9	81.4	71.6
Five years old	91.7	84.5	77.7
Six years old	93.3	85.8	81.6

Table C5

Parents' Perceptions of Importance of Reading and Writing Skills at Home, Compared to Science

	More important than science	As important as science	Less important than science
All respondents (%)	*n*=1425	*n*=1425	*n*=1425
	43.8	53.6	2.5
Income status (%)	1395	1395	1395
Annual income less than $25,000	44.0	53.5	2.5
Annual income $25,000–$50,000	41.3	55.9	2.8
Annual income $50,000–$75,000	51.0	46.3	2.6
Annual income $75,000–$100,0000	43.3	54.7	2.0
Annual income $100,000 or higher	37.1	60.1	2.8
Parent highest level of education (%)	*n*=1423	*n*=1423	*n*=1423
Less than high school	51.1	47.6	1.3
High school	47.7	50.0	2.4
Some college	42.3	54.4	3.3
College graduate or higher	40.0	57.7	2.3
Parent gender (%)	*n*=1425	*n*=1425	*n*=1425
Parent is male	46.9	49.7	3.3
Parent is female	41.2	57.0	1.8
Child age (%)	*n*=1425	*n*=1425	*n*=1425
Three years old	48.3	43.3	8.4
Four years old	45.1	53.9	1.0
Five years old	43.3	55.2	1.5
Six years old	41.2	57.4	1.4

Table C6

Parents' Perceptions of Importance of Learning Social Skills at Home, Compared to Science

	More important than science	As important as science	Less important than science
All respondents (%)	*n*=1430	*n*=1430	*n*=1430
	47.1	49.5	3.4
Income status (%)	*n*=1400	*n*=1400	*n*=1400
Annual income less than $25,000	48.1	50.3	1.5
Annual income $25,000–$50,000	48.3	49.6	2.1
Annual income $50,000–$75,000	46.1	49.0	4.9
Annual income $75,000–$100,0000	49.4	47.0	3.5
Annual income $100,000 or higher	42.7	53.3	4.0
Parent highest level of education (%)	*n*=1429	*n*=1429	*n*=1429
Less than high school	43.4	55.4	1.2
High school	41.1	55.5	3.4
Some college	50.9	45.8	3.3
College graduate or higher	48.8	46.8	4.4
Parent gender (%)	*n*=1430	*n*=1430	*n*=1430
Parent is male	49.2	46.9	3.9
Parent is female	45.3	51.6	3.0
Child age (%)	*n*=1430	*n*=1430	*n*=1430
Three years old	49.6	44.4	6.0
Four years old	53.8	45.0	1.2
Five years old	47.6	48.3	4.1
Six years old	40.9	56.3	2.8

Table C7

Parents' Perceptions of Importance of Learning Math Skills at Home, Compared to Science

	More important than science	As important as science	Less important than science
All respondents (%)	*n*=1413	*n*=1413	*n*=1413
	26.0	71.4	2.7
Income status (%)	*n*=1383	*n*=1383	*n*=1383
Annual income less than $25,000	30.7	68.2	1.1
Annual income $25,000–$50,000	30.6	67.9	1.5
Annual income $50,000–$75,000	25.4	68.5	6.1
Annual income $75,000–$100,0000	27.1	70.7	2.1
Annual income $100,000 or higher	16.2	81.5	2.3
Parent highest level of education (%)	*n*=1412	*n*=1412	*n*=1412
Less than high school	39.5	59.9	.64
High school	29.3	67.3	3.4
Some college	26.5	70.1	3.4
College graduate or higher	18.4	79.4	2.2
Parent gender (%)	*n*=1413	*n*=1413	*n*=1413
Parent is male	28.1	67.9	4.0
Parent is female	24.2	74.2	1.5
Child age (%)	*n*=1413	*n*=1413	*n*=1413
Three years old	32.0	64.3	3.7
Four years old	28.6	70.1	1.3
Five years old	26.0	71.6	2.4
Six years old	21.2	75.6	3.2

Table C8

Parent Confidence About Their Abilities to Help Child Learn

	Reading and writing skills	Mathematics skills	Behavioral and social skills	Science skills
	Very confident			
All respondents (%)	*n*=1442	*n*=1441	*n*=1442	*n*=1442
	74.7	72.6	70.8	54.3
Income status (%)	*n*=1412	*n*=1411	*n*=1412	*n*=1412
Annual income less than $25,000	73.5	63.1	71.1	43.6
Annual income $25,000–$50,000	73.4	69.8	74.1	49.0
Annual income $50,000–$75,000	64.9	69.9	64.9	57.3
Annual income $75,000–$100,0000	84.5	76.1	72.5	60.9
Annual income $100,000 or higher	77.9	80.6	71.5	62.0
Parent highest level of education (%)	*n*=1441	*n*=1440	*n*=1441	*n*=1440
Less than high school	66.8	47.2	66.0	40.6
High school	68.8	66.6	67.6	43.2
Some college	78.9	76.4	75.6	56.5
College graduate or higher	77.7	82.4	70.4	64.7
Parent gender (%)	*n*=1442	*n*=1442	*n*=1442	*n*=1442
Parent is male	73.4	72.6	69.2	58.4
Parent is female	75.8	72.6	72.2	50.8
Child age (%)	*n*=1442	*n*=1442	*n*=1442	*n*=1442
Three years old	68.6	70.8	65.3	53.5
Four years old	70.6	67.2	71.1	52.7
Five years old	73.1	72.0	72.4	55.0
Six years old	82.3	77.5	72.1	55.0

How Parents Support Early Learning

Table C9

Parent Reports of Learning Activities They Do With Child Daily

	Reading/ telling stories	Household chores	Reading and writing skills	Singing songs/ playing musical instruments	Watching educational TV/videos/ games/apps
	Daily				
All respondents (%)	*n*=1442	*n*=1441	*n*=1442	*n*=1441	*n*=1441
	67.7	63.1	49.7	46.8	43.1
Income status (%)	*n*=1412	*n*=1411	*n*=1412	*n*=1411	*n*=1411
Annual income less than $25,000	61.2	60.6	55.4	42.9	44.4
Annual income $25,000–$50,000	67.8	68.9	54.2	49.1	48.3
Annual income $50,000–$75,000	65.0	64.4	44.5	54.1	44.0
Annual income $75,000–$100,0000	74.4	63.1	44.7	43.0	41.9
Annual income $100,000 or higher	72.3	57.9	48.7	42.0	34.4
Parent highest level of education (%)	*n*=1441	*n*=1440	*n*=1441	*n*=1440	*n*=1439
Less than high school	57.4	56.9	49.0	40.7	42.8
High school	59.2	61.6	47.3	44.9	44.7
Some college	72.4	72.5	54.0	53.7	50.9
College graduate or higher	72.7	57.7	47.5	44.0	34.8
Parent gender (%)	*n*=1442	*n*=1441	*n*=1442	*n*=1441	*n*=1441
Parent is male	58.4	60.0	41.7	35.8	43.6
Parent is female	75.6	65.7	56.4	56.2	42.6
Child age (%)	*n*=1442	*n*=1441	*n*=1442	*n*=1441	*n*=1441
Three years old	75.7	59.0	27.6	58.3	51.3
Four years old	60.1	68.1	36.2	53.2	47.3
Five years old	65.3	64.9	56.7	44.0	42.8
Six years old	70.8	60.3	63.2	39.4	36.2

Table C9 (cont.)

Parent Reports of Learning Activities They Do With Child Daily

	Playing a sport/exercising	Playing games/ puzzles	Doing arts and crafts	Engaging in one or more activity
	Daily			
All respondents (%)	*n*=1442	*n*=1439	*n*=1440	*n*=1442
	34.3	27.4	21.9	93.9
Income status (%)	*n*=1412	*n*=1409	*n*=1410	*n*=1412
Annual income less than $25,000	40.0	28.6	26.7	94.9
Annual income $25,000–$50,000	37.3	28.9	22.7	93.9
Annual income $50,000–$75,000	30.7	29.8	22.3	94.2
Annual income $75,000–$100,0000	28.8	24.5	20.5	92.2
Annual income $100,000 or higher	33.6	25.1	16.7	93.5
Parent highest level of education (%)	*n*=1440	*n*=1438	*n*=1439	*n*=1441
Less than high school	33.6	16.8	25.3	90.9
High school	33.3	28.4	23.3	92.0
Some college	37.2	30.3	22.2	96.9
College graduate or higher	32.7	28.0	19.3	93.3
Parent gender (%)	*n*=1442	*n*=1439	*n*=1440	*n*=1442
Parent is male	32.9	26.3	21.0	91.9
Parent is female	35.6	28.3	22.6	95.5
Child age (%)	*n*=1442	*n*=1439	*n*=1440	*n*=1442
Three years old	52.2	37.0	27.1	96.9
Four years old	34.7	29.9	19.6	94.3
Five years old	34.5	28.0	21.5	95.2
Six years old	24.4	20.0	20.9	90.7

How Parents Support Early Science Learning

Table C10

Parent Reports of Science Activities They Do With Child Daily

	Exploring outdoors	Exploring science in everyday activities	Watching science-related videos/ playing games	Building something
	Daily			
All respondents (%)	*n*=1442	*n*=1442	*n*=1442	*n*=1442
	36.3	26.0	20.3	16.6
Income status (%)	*n*=1411	*n*=1412	*n*=1412	*n*=1412
Annual income less than $25,000	35.8	29.3	21.6	22.1
Annual income $25,000–$50,000	35.9	24.1	25.8	17.7
Annual income $50,000–$75,000	43.6	28.9	23.6	16.1
Annual income $75,000–$100,0000	38.5	27.3	16.1	*n*=**14.1**
Annual income $100,000 or higher	28.2	22.8	13.2	15.1
Parent highest level of education (%)	*n*=1440	*n*=1441	*n*=1441	*n*=1441
Less than high school	37.1	23.0	21.8	16.1
High school	31.2	23.0	22.0	15.6
Some college	43.2	29.1	26.2	17.3
College graduate or higher	32.9	26.3	13.1	16.9
Parent gender (%)	*n*=1442	*n*=1442	*n*=1442	*n*=1442
Parent is male	29.7	22.7	20.8	12.7
Parent is female	41.9	28.8	19.8	19.9
Child age (%)	*n*=1442	*n*=1442	*n*=1442	*n*=1442
Three years old	39.6	26.1	23.3	28.5
Four years old	41.3	24.5	16.9	19.3
Five years old	38.2	30.6	24.2	16.0
Six years old	29.4	22.4	17.0	9.1

Table C10 (cont.)

Parent Reports of Science Activities They Do With Child Daily

	Reading about nature in books/ magazines	Playing science-related puzzles/board games	Engaging in one or more science-related activity
	Daily		
All respondents (%)	*n*=1441	*n*=1436	*n*=1442
	11.7	4.8	58.2
Income status (%)	*n*=1411	*n*=1406	*n*=1412
Annual income less than $25,000	17.9	7.0	61.3
Annual income $25,000–$50,000	10.9	4.7	61.5
Annual income $50,000–$75,000	11.2	5.0	62.2
Annual income $75,000–$100,0000	11.7	3.6	59.3
Annual income $100,000 or higher	9.4	4.0	48.0
Parent highest level of education (%)	*n*=1440	*n*=1434	*n*=1441
Less than high school	9.9	8.9	63.1
High school	13.0	4.5	53.7
Some college	10.4	4.9	65.7
College graduate or higher	12.7	3.3	52.5
Parent gender (%)	*n*=1441	*n*=1436	*n*=1442
Parent is male	10.4	4.1	53.1
Parent is female	12.9	5.4	62.6
Child age (%)	*n*=1441	*n*=1436	*n*=1442
Three years old	15.8	9.1	68.6
Four years old	8.9	5.6	61.6
Five years old	13.5	4.0	59.8
Six years old	9.6	2.7	49.0

Table C11

Parent Reports of the Science Learning Activities Child Likes to do, by Content Area

	Science and engineering practices	Life science	Physical science	Earth and space science
All respondents (%)	*n*=1297	*n*=1297	*n*=1297	*n*=1297
	40.1	36.4	28.5	32.1
Income status (%)	*n*=1273	*n*=1273	*n*=1273	*n*=1273
Annual income less than $25,000	26.5	32.9	20.5	24.3
Annual income $25,000–$50,000	33.7	40.1	24.1	31.2
Annual income $50,000–$75,000	41.7	43.6	31.7	34.0
Annual income $75,000–$100,0000	47.4	33.6	27.2	29.3
Annual income $100,000 or higher	50.9	30.2	37.3	38.3
Parent highest level of education (%)	*n*=1295	*n*=1295	*n*=1295	*n*=1295
Less than high school	19.1	37.6	13.9	23.9
High school	33.4	34.9	17.4	28.1
Some college	38.2	38.9	36.0	33.7
College graduate or higher	52.8	34.5	33.2	35.5
Parent gender (%)	*n*=1297	*n*=1297	*n*=1297	*n*=1297
Parent is male	39.8	35.0	26.6	31.9
Parent is female	40.4	37.5	30.0	32.3
Child age (%)	*n*=1297	*n*=1297	*n*=1297	*n*=1297
Three years old	38.1	40.7	24.1	36.3
Four years old	31.9	33.0	25.8	36.1
Five years old	36.8	39.5	29.4	29.6
Six years old	49.4	33.3	31.6	30.0

Table C11 (cont.)

Parent Reports of the Science Learning Activities Child Likes to do, by Content Area

	Learn about education and technology	Use technological tools	Does not do science	Does not know what activities	Report of interaction with caregiver
All respondents (%)	*n*=1297	*n*=1297	*n*=1297	*n*=1297	*n*=1297
	11.7	7.1	5.5	3.7	9.9
Income status (%)	*n*=1273	*n*=1273	*n*=1273	*n*=1273	*n*=1273
Annual income less than $25,000	6.0	5.4	9.1	7.7	4.5
Annual income $25,000–$50,000	10.0	5.5	8.3	3.0	7.6
Annual income $50,000–$75,000	8.5	7.2	2.8	2.5	15.1
Annual income $75,000–$100,0000	15.6	12.9	2.9	2.9	11.6
Annual income $100,000 or higher	17.8	5.6	4.3	2.3	10.3
Parent highest level of education (%)	*n*=1295	*n*=1295	*n*=1295	*n*=1295	*n*=1295
Less than high school	3.0	11.1	6.7	4.8	2.8
High school	12.9	8.1	6.9	7.7	10.1
Some college	9.5	3.5	6.0	3.6	9.6
College graduate or higher	15.9	8.5	3.8	1.1	12.4
Parent gender (%)	*n*=1297	*n*=1297	*n*=1297	*n*=1297	*n*=1297
Parent is male	13.1	7.5	6.2	5.5	9.3
Parent is female	10.5	6.9	4.9	2.2	10.4
Child age (%)	*n*=1297	*n*=1297	*n*=1297	*n*=1297	*n*=1297
Three years old	8.5	7.5	6.4	3.9	11.4
Four years old	9.4	5.3	8.1	4.4	9.2
Five years old	12.5	6.4	5.7	5.0	9.0
Six years old	13.9	8.8	3.2	1.8	10.4

Table C12

Parent Reports of Supports That Would Help a lot in Doing More Science at Home

	Access to technology	Ways to get yourself (parent) more interested	Ways to get child more interested
	Help a lot		
All respondents (%)	*n*=1414	*n*=1442	*n*=1442
	45.3	51.8	63.5
Income status (%)	*n*=1389	*n*=1412	*n*=1412
Annual income less than $25,000	63.7	67.9	74.2
Annual income $25,000–$50,000	56.3	61.4	69.4
Annual income $50,000–$75,000	45.4	46.0	60.4
Annual income $75,000–$100,0000	28.9	45.5	59.4
Annual income $100,000 or higher	32.5	39.1	57.4
Parent highest level of education (%)	*n*=1412	*n*=1441	*n*=1441
Less than high school	60.3	52.9	62.6
High school	55.8	62.2	69.0
Some college	49.0	55.7	69.3
College graduate or higher	29.0	41.0	54.9
Parent gender (%)	*n*=1414	*n*=1442	*n*=1442
Parent is male	43.3	44.3	59.5
Parent is female	47.0	58.2	67.0
Child age (%)	*n*=1414	*n*=1442	*n*=1442
Three years old	46.6	54.9	63.5
Four years old	43.4	51.2	62.1
Five years old	46.1	54.0	64.4
Six years old	44.8	48.5	63.6

Table C12 (cont.)

Parent Reports of Supports That Would Help a lot in Doing More Science at Home

	Information about what child should learn	Ideas for doing science activities with everyday materials	Ideas for science activities to do with your child
	Help a lot		
All respondents (%)	*n*=1439	*n*=1440	*n*=1438
	64.1	70.9	71.3
Income status (%)	*n*=1409	*n*=1410	*n*=1408
Annual income less than $25,000	80.4	76.9	77.6
Annual income $25,000–$50,000	71.5	76.1	77.2
Annual income $50,000–$75,000	60.6	67.7	66.6
Annual income $75,000–$100,0000	59.7	68.4	72.2
Annual income $100,000 or higher	51.1	67.0	63.4
Parent highest level of education (%)	*n*=1438	*n*=1438	*n*=1437
Less than high school	70.7	63.2	67.3
High school	73.6	72.1	74.5
Some college	67.4	75.5	79.0
College graduate or higher	52.3	68.5	63.6
Parent gender (%)	*n*=1439	*n*=1440	*n*=1438
Parent is male	59.0	63.8	66.1
Parent is female	68.5	76.9	75.7
Child age (%)	*n*=1439	*n*=1440	*n*=1438
Three years old	68.7	78.7	71.3
Four years old	67.1	65.8	69.7
Five years old	61.4	71.0	71.7
Six years old	69.9	72.0	72.0

Types of Media Families Use in Learning Activities

Table C13

Percent of Parents who Report That Child Used Educational Media in the Last Month, by Media Type

	TV and videos	Digital learning games or apps	Websites
	In the last month		
All respondents (%)	*n*=1405	*n*=1410	*n*=1379
	93.6	84.0	46.6
Income status (%)	*n*=1376	*n*=1380	*n*=1351
Annual income less than $25,000	92.3	78.4	47.1
Annual income $25,000–$50,000	91.3	81.8	44.1
Annual income $50,000–$75,000	95.0	84.3	47.9
Annual income $75,000–$100,0000	93.5	88.0	42.0
Annual income $100,000 or higher	96.2	86.0	52.5
Parent highest level of education (%)	*n*=1404	*n*=1408	*n*=1378
Less than high school	85.3	72.9	41.4
High school	93.2	85.7	44.8
Some college	95.2	87.3	48.1
College graduate or higher	95.5	84.0	48.5
Parent gender (%)	*n*=1405	*n*=1410	*n*=1379
Parent is male	94.8	87.5	44.2
Parent is female	92.6	81.1	48.6
Child age (%)	*n*=1405	*n*=1410	*n*=1379
Three years old	95.9	76.6	32.2
Four years old	91.4	82.1	41.0
Five years old	94.5	86.6	44.0
Six years old	92.7	86.7	60.6

Table C14

Parent Reports of Frequency With Which Child Watched TV Shows/Videos About Science

	Weekly or more	Once or twice this past month	Did not do this past month
All respondents (%)	*n*=1440	*n*=1440	*n*=1440
	66.1	22.1	11.8
Income status (%)	*n*=1410	*n*=1410	*n*=1410
Annual income less than $25,000	67.4	18.5	*n*=**14.1**
Annual income $25,000–$50,000	66.0	22.0	12.0
Annual income $50,000–$75,000	66.5	19.2	*n*=**14.3**
Annual income $75,000–$100,0000	65.4	25.4	9.3
Annual income $100,000 or higher	66.9	24.0	9.2
Parent highest level of education (%)	*n*=1439	*n*=1439	*n*=1439
Less than high school	66.4	13.1	20.5
High school	69.3	17.3	13.4
Some college	66.1	23.2	10.7
College graduate or higher	63.9	27.6	8.6
Parent gender (%)	*n*=1440	*n*=1440	*n*=1440
Parent is male	68.3	19.0	12.7
Parent is female	64.3	24.6	11.1
Child age (%)	*n*=1440	*n*=1440	*n*=1440
Three years old	66.2	21.8	12.0
Four years old	64.6	22.0	13.3
Five years old	70.2	19.3	10.5
Six years old	63.0	24.9	12.1

Table C15

Parents' Report of Frequency With Which Child Used Video Games/Apps About Science

	Weekly or more	Once or twice this past month	Did not do this past month
All respondents (%)	*n*=1438	*n*=1438	*n*=1438
	44.6	24.0	31.4
Income status (%)	*n*=1408	*n*=1408	*n*=1408
Annual income less than $25,000	45.6	22.6	31.8
Annual income $25,000–$50,000	44.6	22.5	32.9
Annual income $50,000–$75,000	46.7	21.1	32.2
Annual income $75,000–$100,0000	46.8	24.5	28.7
Annual income $100,000 or higher	41.5	28.1	30.4
Parent highest level of education (%)	*n*=1437	*n*=1437	*n*=1437
Less than high school	50.5	12.1	37.4
High school	41.7	23.0	35.3
Some college	46.5	27.4	26.1
College graduate or higher	42.6	26.1	31.3
Parent gender (%)	*n*=1438	*n*=1438	*n*=1438
Parent is male	51.4	22.5	26.1
Parent is female	38.8	25.3	35.8
Child age (%)	*n*=1438	*n*=1438	*n*=1438
Three years old	46.2	19.8	33.9
Four years old	41.1	25.1	33.9
Five years old	47.3	24.3	28.4
Six years old	43.4	25.3	31.3

Table C16

Parents' Report of Frequency With Which Child Used Websites About Science

	Weekly or more	Once or twice this past month	Did not do this past month
All respondents (%)	*n*=1430	*n*=1430	*n*=1430
	24.9	20.1	55.0
Income status (%)	*n*=1400	*n*=1400	*n*=1400
Annual income less than $25,000	30.3	17.8	51.9
Annual income $25,000–$50,000	28.7	18.2	53.1
Annual income $50,000–$75,000	22.3	17.8	59.9
Annual income $75,000–$100,0000	20.5	21.3	58.2
Annual income $100,000 or higher	23.5	24.1	52.4
Parent highest level of education (%)	*n*=1429	*n*=1429	*n*=1429
Less than high school	28.3	*n*=**14.4**	57.3
High school	26.5	17.4	56.1
Some college	24.7	20.6	54.7
College graduate or higher	22.8	23.3	53.9
Parent gender (%)	*n*=1430	*n*=1430	*n*=1430
Parent is male	24.7	19.2	56.1
Parent is female	25.1	20.8	54.1
Child age (%)	*n*=1430	*n*=1430	*n*=1430
Three years old	19.6	11.6	68.8
Four years old	19.3	22.2	58.5
Five years old	26.6	20.6	52.8
Six years old	29.7	22.7	47.5

Table C17

Percent of Parents Who Help Their Children With Media Weekly or More, by Type of Support

	Monitor child's viewing and playing	Compliment or encourage child	Explain or talk about what are watching/playing
	Weekly or more		
All respondents (%)	*n*=1322	*n*=1323	*n*=1324
	94.9	94.0	86.2
Income status (%)	*n*=1294	*n*=1296	*n*=1297
Annual income less than $25,000	92.3	88.8	87.0
Annual income $25,000–$50,000	96.5	94.8	85.1
Annual income $50,000–$75,000	94.1	93.3	86.7
Annual income $75,000–$100,0000	94.6	93.8	88.2
Annual income $100,000 or higher	96.0	97.8	85.0
Parent highest level of education (%)	*n*=1320	*n*=1322	*n*=1323
Less than high school	94.0	92.4	88.9
High school	93.8	94.4	84.6
Some college	95.8	94.8	87.9
College graduate or higher	95.1	93.6	84.7
Parent gender (%)	*n*=1322	*n*=1323	*n*=1324
Parent is male	94.7	92.7	82.5
Parent is female	95.1	95.1	89.4
Child age (%)	*n*=1322	*n*=1323	*n*=1324
Three years old	96.1	94.1	84.6
Four years old	92.4	92.5	88.4
Five years old	96.0	94.8	88.0
Six years old	94.8	94.2	83.9

Table C17 (cont.)

Percent of Parents Who Help Their Children With Media Weekly or More, by Type of Support

	Watch show or play along	Help child access	Talk about connections
	Weekly or more		
All respondents (%)	*n*=1324	*n*=1320	*n*=1320
	75.3	72.7	69.2
Income status (%)	*n*=1297	*n*=1293	*n*=1292
Annual income less than $25,000	82.2	70.7	68.1
Annual income $25,000–$50,000	75.5	75.1	75.5
Annual income $50,000–$75,000	74.1	72.1	67.1
Annual income $75,000–$100,0000	73.5	72.3	71.0
Annual income $100,000 or higher	71.7	71.6	63.3
Parent highest level of education (%)	*n*=1323	*n*=1319	*n*=1319
Less than high school	80.3	66.1	55.8
High school	78.1	74.5	69.6
Some college	76.0	79.4	77.2
College graduate or higher	71.2	67.8	66.0
Parent gender (%)	*n*=1324	*n*=1320	*n*=1320
Parent is male	74.2	72.1	64.8
Parent is female	76.3	73.3	72.9
Child age (%)	*n*=1324	*n*=1320	*n*=1320
Three years old	77.5	73.7	70.1
Four years old	79.5	78.0	71.1
Five years old	74.1	70.7	71.5
Six years old	72.7	70.9	65.2

Table C18

Percent of Parents Who Report That They are Satisfied With Media Resources to Help Child Learn Science

	Satisfaction with science media
All respondents (%)	*n*=1439
	54.0
Income status (%)	*n*=1409
Annual income less than $25,000	58.6
Annual income $25,000–$50,000	56.0
Annual income $50,000–$75,000	50.4
Annual income $75,000–$100,0000	51.0
Annual income $100,000 or higher	56.9
Parent highest level of education (%)	*n*=1437
Less than high school	61.3
High school	55.3
Some college	48.3
College graduate or higher	55.9
Parent gender (%)	*n*=1439
Parent is male	54.4
Parent is female	53.7
Child age (%)	*n*=1439
Three years old	53.3
Four years old	56.0
Five years old	54.2
Six years old	53.0

Table C19

Percent of Parents Who Report That Child has Learned "a lot" From Media, by Content Area

	Reading or vocabulary	Music or art	Healthy habits	Behavior and social skills	Science
	Child has learned "a lot"				
All respondents (%)	*n*=1441	*n*=1439	*n*=1442	*n*=1440	*n*=1436
	46.6	44.7	33.7	29.9	28.9
Income status (%)	*n*=1411	*n*=1409	*n*=1411	*n*=1410	*n*=1406
Annual income less than $25,000	54.5	54.7	58.7	40.5	31.3
Annual income $25,000–$50,000	47.3	45.4	42.1	36.0	28.6
Annual income $50,000–$75,000	46.2	44.7	24.9	23.9	24.5
Annual income $75,000–$100,0000	49.2	42.3	28.1	30.9	28.7
Annual income $100,000 or higher	38.5	36.9	17.2	21.4	33.0
Parent highest level of education (%)	*n*=1440	*n*=1438	*n*=1440	*n*=1438	*n*=1434
Less than high school	49.2	40.4	49.8	32.4	16.9
High school	47.4	47.8	43.9	33.3	26.6
Some college	52.0	52.1	34.8	31.1	32.8
College graduate or higher	40.3	37.4	20.2	25.6	31.3
Parent gender (%)	*n*=1441	*n*=1439	*n*=1442	*n*=1440	*n*=1436
Parent is male	44.9	42.1	29.7	26.3	29.0
Parent is female	48.1	46.8	37.1	33.0	28.8
Child age (%)	*n*=1441	*n*=1439	*n*=1442	*n*=1440	*n*=1436
Three years old	49.6	47.3	36.3	28.3	24.8
Four years old	41.5	44.7	30.2	29.0	21.7
Five years old	51.6	46.5	37.8	32.4	30.0
Six years old	43.5	41.4	30.6	28.9	34.6

Table C19 (cont.)

Percent of Parents Who Report That Child has Learned "a lot" From Media, by Content Area

	Math	Problem solving or critical thinking	Information about people and community	Languages other than English
	Learned a lot			
All respondents (%)	*n*=1436	*n*=1427	*n*=1434	*n*=1436
	23.7	24.2	18.0	17.6
Income status (%)	*n*=1406	1398	*n*=1404	*n*=1405
Annual income less than $25,000	32.9	30.7	23.9	24.3
Annual income $25,000–$50,000	27.9	27.4	19.2	19.9
Annual income $50,000–$75,000	15.9	19.8	16.1	15.6
Annual income $75,000–$100,0000	24.0	31.9	15.6	19.3
Annual income $100,000 or higher	18.2	15.2	16.1	11.3
Parent highest level of education (%)	*n*=1434	*n*=1425	*n*=1432	*n*=1434
Less than high school	26.6	23.0	12.5	22.0
High school	27.2	22.2	19.1	18.4
Some college	25.1	26.6	20.2	18.5
College graduate or higher	18.8	23.5	17.5	*n*=**14.5**
Parent gender (%)	*n*=1436	*n*=1427	*n*=1434	*n*=1436
Parent is male	20.8	18.9	*n*=**14.5**	15.1
Parent is female	26.1	28.6	21.0	19.8
Child age (%)	*n*=1436	*n*=1427	*n*=1434	*n*=1436
Three years old	17.6	16.8	*n*=**14.2**	15.0
Four years old	19.3	18.0	*n*=**14.7**	16.1
Five years old	26.2	29.2	19.0	19.2
Six years old	27.2	27.2	21.2	18.5

Table C20

Percent of Parents Who Report Using a Given Resource to Find Educational Videos and Games Often

	Searches on the Internet	TV networks you know and trust	Schools or teachers	Family members or friends
	Often			
All respondents (%)	*n*=1439	*n*=1441	*n*=1434	*n*=1442
	55.2	43.5	43.7	31.8
Income status (%)	*n*=1409	*n*=1411	*n*=1404	*n*=1412
Annual income less than $25,000	58.0	49.3	41.2	31.0
Annual income $25,000–$50,000	56.2	47.3	48.7	31.0
Annual income $50,000–$75,000	57.4	41.8	45.6	30.4
Annual income $75,000–$100,0000	54.8	42.9	43.2	34.3
Annual income $100,000 or higher	47.7	36.6	39.1	30.5
Parent highest level of education (%)	*n*=1437	*n*=1439	*n*=1433	*n*=1441
Less than high school	51.6	42.8	41.7	22.1
High school	56.7	45.8	40.0	24.3
Some college	64.8	49.9	48.3	43.4
College graduate or higher	46.9	36.3	42.7	29.6
Parent gender (%)	*n*=1439	*n*=1441	*n*=1434	*n*=1442
Parent is male	54.8	41.5	36.7	27.1
Parent is female	55.6	45.2	49.7	35.8
Child age (%)	*n*=1439	*n*=1441	*n*=1434	*n*=1442
Three years old	54.8	42.1	34.0	36.1
Four years old	53.7	43.9	34.9	34.5
Five years old	52.3	42.5	40.0	25.0
Six years old	59.3	45.1	58.1	34.5

Table C20 (cont.)

Percent of Parents Who Report Using a Given Resource to Find Educational Videos and Games Often

	Library, museums, community org.	Websites such as Facebook, Pinterest, Instagram	Reviews in newspapers, magazines, or websites
	Often		
All respondents (%)	*n*=1438	*n*=1429	*n*=1436
	21.2	19.6	18.1
Income status (%)	*n*=1408	*n*=1405	*n*=1405
Annual income less than $25,000	26.6	27.0	26.4
Annual income $25,000–$50,000	24.7	22.2	25.4
Annual income $50,000–$75,000	16.7	11.5	*n*=**14.3**
Annual income $75,000–$100,0000	19.6	25.2	8.2
Annual income $100,000 or higher	17.2	*n*=**14.9**	15.0
Parent highest level of education (%)	*n*=1436	*n*=1428	*n*=1434
Less than high school	17.3	19.4	*n*=**14.2**
High school	21.8	21.0	21.5
Some college	22.4	22.1	19.6
College graduate or higher	21.1	16.5	16.0
Parent gender (%)	*n*=1438	*n*=1429	*n*=1436
Parent is male	18.0	13.3	15.7
Parent is female	23.9	24.8	20.2
Child age (%)	*n*=1438	*n*=1429	*n*=1436
Three years old	26.0	16.0	15.4
Four years old	21.7	19.4	12.6
Five years old	18.9	20.0	23.5
Six years old	20.6	21.2	17.7

Table C21

Percent of Parents Who Report Using a Given Resource to Find Educational Videos and Games Sometimes

	Searches on the Internet	TV networks you know and trust	Schools or teachers	Family members or friends
	Sometimes			
All respondents (%)	*n*=1439	*n*=1441	*n*=1434	*n*=1442
	25.8	31.8	31.7	40.0
Income status (%)	*n*=1409	*n*=1411	*n*=1404	*n*=1412
Annual income less than $25,000	25.6	28.1	34.6	34.9
Annual income $25,000–$50,000	25.1	29.7	25.4	38.6
Annual income $50,000-$75,000	22.7	31.7	28.1	40.4
Annual income $75,000-$100,0000	22.1	34.3	31.8	42.3
Annual income $100,000 or higher	34.4	34.9	38.4	43.8
Parent highest level of education (%)	*n*=1437	*n*=1439	*n*=1433	*n*=1441
Less than high school	21.9	29.5	27.3	40.5
High school	28.3	29.4	35.1	44.7
Some college	19.1	28.5	27.5	34.1
College graduate or higher	31.7	37.4	34.7	42.2
Parent gender (%)	*n*=1439	*n*=1441	*n*=1434	*n*=1442
Parent is male	24.4	31.0	33.1	43.4
Parent is female	27.0	32.5	30.4	37.2
Child age (%)	*n*=1439	*n*=1441	*n*=1434	*n*=1442
Three years old	22.0	36.1	32.9	35.6
Four years old	26.2	32.8	38.2	39.6
Five years old	27.3	31.0	34.4	42.4
Six years old	26.1	29.7	24.1	40.4

Table C21 (cont.)

Percent of Parents Who Report Using a Given Resource to Find Educational Videos and Games Sometimes

	Library, museums, community org.	Websites such as Facebook, Pinterest, Instagram	Reviews in newspapers, magazines, or websites
	Sometimes		
All respondents (%)	*n*=1438	*n*=1429	*n*=1436
	32.8	22.8	35.7
Income status (%)	*n*=1408	*n*=1405	*n*=1405
Annual income less than $25,000	28.4	21.2	31.3
Annual income $25,000–$50,000	31.3	24.4	34.4
Annual income $50,000–$75,000	27.8	24.7	32.2
Annual income $75,000–$100,0000	39.8	19.5	42.0
Annual income $100,000 or higher	38.5	23.0	38.7
Parent highest level of education (%)	*n*=1436	*n*=1428	*n*=1434
Less than high school	36.0	16.4	36.1
High school	23.5	21.1	35.9
Some college	33.9	27.0	37.0
College graduate or higher	36.6	22.4	34.1
Parent gender (%)	*n*=1438	*n*=1429	*n*=1436
Parent is male	30.0	19.7	34.4
Parent is female	35.1	25.4	36.8
Child age (%)	*n*=1438	*n*=1429	*n*=1436
Three years old	29.5	26.5	36.6
Four years old	29.7	26.2	41.3
Five years old	35.9	22.3	29.6
Six years old	33.3	19.0	37.6

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