MATHITUDES

STRUCTURE

- Activity Overview & Preparation (5-10) MIN)
- Introduction (3-5 MIN)
- Activity & Discussion (25-30 MIN)
- Closing (5-10 MIN)

OBJECTIVES

At the end of this activity, participants will be able to:

- Recognize and reflect on their feelings about math
- Recognize how their own emotions about math may influence how their children perceive math

MATERIALS

Printout of (or link to) the activity

TIME

40-60 Minutes

ACTIVITY 1.3

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MATHITUDES

GETTING READY

FACILITATOR NOTES

ANSWER GUIDE

Use the answer guide to provide caregivers with additional details on responses to the activity prompts.

BUILDING CAPACITY

This activity builds on the **Attitudes and Dispositions** module, but does not require module completion. (Module 1, Segment 2)

ADAPTATIONS

Use these ideas to modify the activity based on:

- child age,
- time and resources available for implementation
- caregiver needs.

TIPS

Blue text indicates something that facilitators might say (e.g.,"Today we are going to do a math activity that might trigger emotions and attitudes about math"). Regular text is information for facilitation.

ACTIVITY 1.3

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MATHITUDES

GETTING READY

ACTIVITY OVERVIEW

In this activity, you will help caregivers understand their feelings about math. First, you will give caregivers a math problem that is designed to possibly lead to feeling uneasy about the problem. Then, discussing these feelings of uneasiness will help caregivers become aware of their own feelings about math and make it easier for them to reflect on how they signal their math attitudes to their children.

ACTIVITY 1.3

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MATHITUDES

GETTING READY

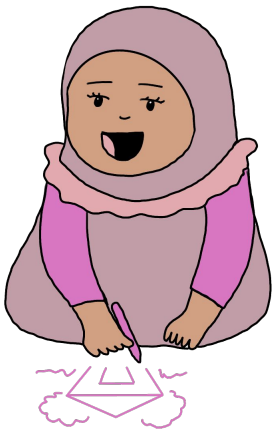
PREPARATION

5-10 Minutes

If the activity is to be conducted in person, print or prepare digital activity handouts. If the activity is to be conducted using an online tool, like Zoom or Meet, have the document ready to share when your caregivers join the group

Arrange caregiver seats in a way that they can see a screen or wall where you will show the math problems

Pre-load the file so the math problems are ready to show, or hand out the printed copies face down.



Before the activity, review the three questions provided for the activity and select the 1 or 2 question(s) you will use.

Set up the questions so the answer guide is not visible to the caregivers during your initial presentation.

We suggest allowing about 3 minutes per question during the first part of the activity, but you can adjust that to an amount of time with which you feel comfortable

Review the additional DREME family math resources to support understanding executive functions and math anxiety:

Parents Fear Math No More

https://familymath.stanford.edu/for-educators/parents-fear-math-no-more/

Executive Functions: Supporting Foundational Skills for Early Math Learning

https://dreme.stanford.edu/news/executive-functions-supporting-foundational-skills-for-early-math-learning/

ACTIVITY 1.3

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ACTIVITY

INTRODUCTION
3-5 Minutes

Present the activity to the caregivers with a note of caution about the experience: **"Today we are going to do a math activity that might trigger emotions and attitudes about math. For some of you it might make you feel anxious, for others you might feel interested or accomplished. No matter what you feel, all emotions are OK. The activity is not to test your math skills, but just to make you aware of what you and other people feel. When thinking about math.What is important is to be aware of your own feelings about math because your child might notice those feelings."**

ACTIVITY & DISCUSSION
Part 1: 25 - 30 Minutes

In this activity, share the questions you selected, one at a time, with participating caregivers.

All participants should have the same experience and the same amount of time to complete the questions, so make sure participants that arrive early don't get a head start.

If you use the projection version, once all caregivers are ready, share the selected questions and ask caregivers to follow the prompts.

If you use the paper version, ask caregivers to keep the paper version face down until you ask them to flip it over. Once all caregivers have the paper, ask them to flip it and to answer the question(s).

ACTIVITY

When you're ready to start, explain that they have 3 minutes (or another time frame you selected) to answer each question. The goal is to help caregivers identify their quick, gut reaction, so keep the time brief.

"Please take a look at this activity. I'll read the first question and then I would like for you to solve it as best as you can. You will have 3 minutes to work through each question."

"Please flip over your paper. Read the questions and answer them the best you can. You will have 3 minutes for each question."

ACTIVITY & DISCUSSION

Part 2: 25 - 30 Minutes

Once the time is up, ask caregivers if they'd like to share what they did. See what responses caregivers gave; some people will really want to know if they got the right answer. Others will just want to know what the answer.

Ask questions about how the activity made caregivers feel, such as, **"How did these questions make you feel? Was anyone excited to figure it out? Did anyone get nervous or anxious when you saw the questions?"** etc. You can direct these questions to the whole group, or to smaller groups of caregivers to discuss among themselves.

CLOSING
(5-10 Min)

Incorporate these key takeaways in how you close the session with caregivers. You can state them as written, or paraphrase based on the caregiver's experiences.

- The experience of doing math problems can reveal feelings about math
- We can unintentionally reveal negative feelings about math to our children

To help solidify learning, ask families to share one thing they learned about early math from this activity.

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FACILITATION TIPS

Help caregivers respond to frustration with math. If caregivers discuss how to support their children when they are frustrated, you can share additional resources that will connect them to information about math attitudes. One helpful link is this video called Encouraging Positive Math Attitudes.

Encouraging Positive Math Attitudes Video
https://vimeo.com/showcase/7875996

It is possible you may hear a full range of emotional connections to math. It is likely that some caregivers will say they dislike math, that they are "bad" at math, or that math makes them anxious. It is also possible that some caregivers may say they like math or are very good at math. Use this opportunity to help caregivers recognize that there is a big range of possible emotional connections to math, and that these feelings about math might be influenced (at least partially) by their own experiences with math.

Be prepared to separate feelings about liking or not liking math from feelings about being good or bad at math. Use this activity to help caregivers who think they are "bad" at math realize that math takes work for most people, and it is okay to use a paper and pencil or a calculator (or a friend) to help solve a problem.

Be prepared to separate the emotions in items 1 and 2 from emotions about whether math is important or useful. Watch for comments about math being "a waste of time" or "not important" or "something I can live without." You can help caregivers by pointing out everyday examples where math is needed, and that math is useful, even if it feels hard.

MATHITUDES

ADAPTATIONS

TIME & RESOURCES

If you have limited time to share the activity with caregivers, consider focusing on one math problem.

CAREGIVER NEED

If the caregivers you work with require accommodations to participate be sure to support their needs by

- Offering closed captioning
- Providing all materials in caregivers' native language (with translations when relevant)
- For caregivers who prefer to engage in ways other than reading the materials or who have limited literacy skills, select one topic to go over as a group. Prepare a group discussion that does not require the caregivers to read. Instead you can read the topic page out loud, paraphrase content on a white board in bullets, or use a digital space like a jamboard to discuss key takeaways for an identified topic. Be sure to prepare these bullets in advance.

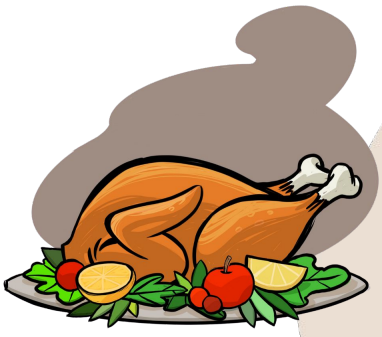
ADDITIONAL ADJUSTMENTS

If there is any concern about the caregivers doing the math problem(s) you can adjust this activity by sharing a selected math problem as an example, and then asking the caregivers to imagine a math problem that would be challenging for them. Once they have that experience in their mind, ask them to reflect on emotions that they feel as they think about the challenging problem. Use this experience to continue with the activity prompts.

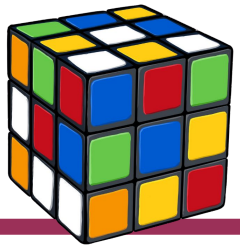
MATHITUDES

CAREGIVER MATERIALS

1) You are helping a friend prepare dinner by following a recipe for cooking turkey. The recipe explains that you must allow 20 minutes for each pound of turkey and to add 5 minutes per pound if the turkey is stuffed. The turkey weighs 16 pounds and is stuffed. Your friend is having difficulty trying to figure out what time the turkey needs to go in the oven if you want to have dinner at two o'clock in the afternoon and allow ½ hour for cooling and carving. She asked you: "What time do I need to put the turkey in the oven?"



2) A cube that has 4-centimeter sides is painted blue on the outside, and then it is cut into 1-centimeter cube segments. How many of the small cubes have no blue sides?



3) You are a server at a local restaurant where the staff share their tips. You work with a host who seats customers and three other servers. At the end of your shift, you have earned $125.00 in tips. Your employer expects that you will provide 10% of your tips to the host and split the remainder of your tips into 4 equal portions for you and the other three servers. How much do you have to give the host and how much will you get to keep for yourself?

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ANSWER GUIDE

1) Since the turkey is stuffed, then it will need to be cooked for 25 minutes per pound. 16 pounds means 16 x 25 = 400 minutes. You add 30 minutes for the cooling and carving, and the elapsed time required is 430 minutes, which you divide by 60 minutes per hour to determine it is 7 hours 10 minutes. You want it ready at 2 PM, so you subtract 7 hours and 10 minutes from that time to get the moment the turkey needs to be put in the oven: 6:50 AM.

2) The cubes with paint would be all those that are on the outside. The ones without paint would be the ones that could be assembled to make a core cube 2 cm to a side. To envision this, imagine that you slice the top of the cube 1 cm deep to take the painted cubes away. Then you repeat for the bottom. Then the left and right side., then the front and back. Since the inner cube is 2 by 2 by 2, then there would be 8 cubes having no paint at all on any of their faces.

3) You have $125.00. First you give the host 10%. Ten percent as a decimal is .10. We multiply the total amount times 0.10 ($125.00 x 0.10) to get $12.50. [One easy way to do this move the decimal in $125.00 one position to the left, which works because it is equivalent to dividing by 10 (you might have a discussion about why this 'trick' works!)

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ACTIVITIES FOR FAMILY SUPPORT PROFESSIONALS:
EXPLORING EARLY MATHEMATICS

"Everyone Succeeds" was developed for Family Support Professionals to use with the families they serve. All activities are available at no cost, on the Institute of Child Development Math and Numeracy Lab website, for private use with families and caregivers. These materials may not be reproduced or distributed for any for-profit effort without explicit permission from lead developers, Drs. Wackerle-Hollman and Mazzocco.

Module 1: How Attitudes and Dispositions May Affect Early Math

- Activity 1.1 Everyone Succeeds
- Activity 1.2 Flipping the Script
- Activity 1.3 Mathitudes
- Activity 1.4 Learning from Math Mistakes
- Activity 1.5 Comments, Questions, and Conversations (CQC's)
- Activity 1.6 Attitude Adjustments
- Activity 1.7 We Are All Math People

Module 2: Math is Numbers and More: Exploring Early Math Topics

- Activity 2.1 Math Kaleidoscope
- Activity 2.2 Early Math Topics
- Activity 2.3 Picturing Math
- Activity 2.4 Measuring Up!
- Activity 2.5 Toddlers Under Construction

Module 3: Finding Math in Everyday Life

- Activity 3.1 Early Math Success Stories
- Activity 3.2 Math Snacks
- Activity 3.3 Becoming a Math Detective
- Activity 3.4 Make a Statement with Math
- Activity 3.5 Everyday Math in Action
- Activity 3.6 Routines Roadmap

These activities were developed by the Math and Numeracy Lab, directed by Michèle Mazzocco, Institute of Child Development (ICD), in collaboration with Alisha Wackerle-Hollman, Director of the IGDIlab, Department of Educational Psychology, both at the University of Minnesota. Contributors include ICD doctoral students Sarah E. Pan and Jasmine R. Ernst. This work was supported by Heising-Simons Foundation DREME Network Awards 2018-0670 and 2020-1777. We thank members of the Math and Numeracy Lab that contributed to this work, family support professionals who provided feedback or welcomed us (and our activities) into their classrooms, and our community partner consultants who provided insight on language selection and delivered illustrations to make this work meaningful to the Latine and Somali communities.

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