BRIDGES IN MATHEMATICS 1

GRADE 1 SUPPLEMENT

Set D6 Measurement: Duration

Includes

Skills & Concepts

★ compare and order events according to duration

Bridges in Mathematics Grade 1 Supplement
Set D6 Measurement: Duration

Bridges in Mathematics is a standards-based K–5 curriculum that provides a unique blend of concept development and skills practice in the context of problem solving. It incorporates the Number Corner, a collection of daily skill-building activities for students.

The Math Learning Center is a nonprofit organization serving the education community. Our mission is to inspire and enable individuals to discover and develop their mathematical confidence and ability. We offer innovative and standards-based professional development, curriculum, materials, and resources to support learning and teaching. To find out more, visit us at www.mathlearningcenter.org.

Set D6 ★ Activity 1

ACTIVITY

The Cheetah, the Tortoise & the Hare

Overview
After listening to a variation of a familiar folktale, students order several sets of events according to how long they take.

Skills & Concepts
★ compare and order events according to duration

You'll need
★ Animal Labels (page D6.4, one copy, see Advance Preparation)

★ whiteboard and markers

★ masking tape

★ *The Tortoise and the Hare* (see note)

Advance Preparation Run 1 copy of the Animal Labels blackline on paper or cardstock. Laminate the sheet if you want, and then cut the labels apart.

Note If your students aren't familiar with the story of *The Tortoise and the Hare*, you'll want to read it to them before this session. (You'll probably find several different versions of the story in your school library; if not, you can find numerous versions online.)

Instructions for The Cheetah, the Tortoise & the Hare
1. Gather students to your discussion circle. Show students the Animal Labels you've prepared and review the name of each animal with the class. Explain that you're going to tell a story about the day these 3 animals had a race. Ask students to predict which animal will take the least amount of time to finish the race and which will take the most. Then tell the story below.

For days after his big race with the tortoise, the hare could not stop thinking about it. "I can run a hundred times faster than Tortoise! I should have beat him by a mile! If only I hadn't fallen asleep!"

No matter what he did, Hare couldn't stop thinking about how he should have won. Finally, he decided to challenge the tortoise to another race. But this time, he'd invite the cheetah to join them. Everyone said that Cheetah was the fastest runner of all the animals, but the more the hare thought about it, the more convinced he was that he could win if only he tried hard enough.

That very afternoon, he met Tortoise on the path. "Hey, Tortoise! That was a great race last month. It was so much fun, I want to do it again, but this time I want to invite you and *Cheetah to race with me."*

Tortoise laughed and said, "Sure, I'll race with you again. It was fun, but I don't think there's any way either of us can beat Cheetah. Everyone knows Cheetah's the fastest runner of all the animals.

Activity 1 The Cheetah, the Tortoise & the Hare (cont.)

Cheetah agreed to take part in the race and as the big day drew near, the hare practiced his running every morning. He said to himself, "No one's going to beat me this time—no sirree! I know I can win if only I try hard enough."

When the day finally arrived, the animals came from miles around to watch. The cheetah, the hare, and the tortoise all took their places at the starting line and took off as soon as Old Owl gave the signal. The tortoise plodded along in his slow and steady way. He knew that he would never beat the cheetah, but he was having fun anyway. The hare closed his eyes and ran as fast and as hard as he'd ever run in his life. When he opened them, he saw the cheetah just a little ahead of him on the trail. He shut his eyes and ran even harder. When he opened his eyes again, there was the cheetah, just a little ahead of him.

"I can beat that cheetah if I just try my very best, I know I can!" He shut his eyes and ran for all he was worth. When he opened them, all the animals were cheering, including Cheetah. "Hooray for Hare!" everyone was yelling. Then Old Owl came up and shook his paw. "Congratulations, Hare! We've never seen you run such a good race, even though Cheetah beat you."

"He did?" gasped the hare. "I thought for sure I was going to win."

"No one expected you to beat Cheetah. He's the fastest runner of all the animals. He actually ran the course three times to keep you company while you were running, but you never noticed because you had your eyes shut the whole time. Still, you did your very best, and we're all proud of you."

Just then Tortoise came plodding over the finish line. "What a great race!" he said to Hare. "It sure was fun to see Cheetah speeding by. We all had fun, didn't we?" And Hare had to agree, even though he didn't win.
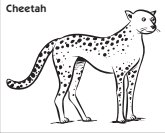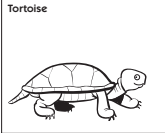
2. Discuss the story when you've finished. Who won the race? Who came in second? Who came in last? Which animal ran the race in the least amount of time? Who took longest to complete the race? Why didn't the hare win, even though he tried his very best? (Cheetahs really do run faster than any other animal, including humans. Some students may be interested in researching this in the library or online.)

3. Write "1st", "2nd", and "3rd" on the whiteboard. Work with input from the class to post each of the Animal Labels where it belongs. As you discuss the labels with the class, you might want to add some other descriptive phrases, as shown on the next page.

4. Then ask students which would take the most amount of time: walking to the door and back, drawing 5 circles each as big as an orange on the whiteboard, or counting to 30. After setting the ground rules very carefully, call 3 confident volunteers to try this experiment as the rest of the class watches. Remind them that the first child has to get up from her place in the circle, walk (not run) to the door and back, and sit down again in her spot. The second child has to draw 5 good, orange-sized circles, not little dots, on the whiteboard. The third child needs to count clearly and loudly enough for everyone to hear. (Explain to the class that this is an experiment rather than a race, and they'll need to keep as quiet as possible so their classmates can make their best efforts. Have the 3 volunteers get prepared and then give them a signal to start at the same time.)

5. Record the results under the appropriate labels on the whiteboard.

Activity 1 The Cheetah, the Tortoise & the Hare (cont.)

| 1st	2nd	3rd
Cheetah	Hare	Tortoise
Fastest Least Amount of Time		Slowest Most Amount of Time
• Drawing 5 circles	• Walking to the door and back	• Counting to 30

6. Repeat steps 4 and 5 as time allows. Here are some more experiments you can try, or you might develop some of your own with the class. Call on a different trio of volunteers to perform each while the other students watch.

Which of the 3 tasks will take the least amount of time? Which will take the most?

ADDITIONAL EXPERIMENTS			
Experiment Number	Task 1	Task 2	Task 3
Experiment 1	Stack 15 Unifix cubes	Write your first and last name on the whiteboard	Jump up and down 12 times
Experiment 2	Tie both shoes	Sing Happy Birthday (have the class sing along)	Walk to the sink, wash your hands with soap and water, dry them, and return to your place in the circle
Experiment 3	Build a flower with 7 hexagon pattern blocks	Work a very simple puzzle	Recite the alphabet (Have the class recite the alphabet together.)

7. Record the results of each experiment on the board.

Animal Labels

Cheetah

Hare

Tortoise
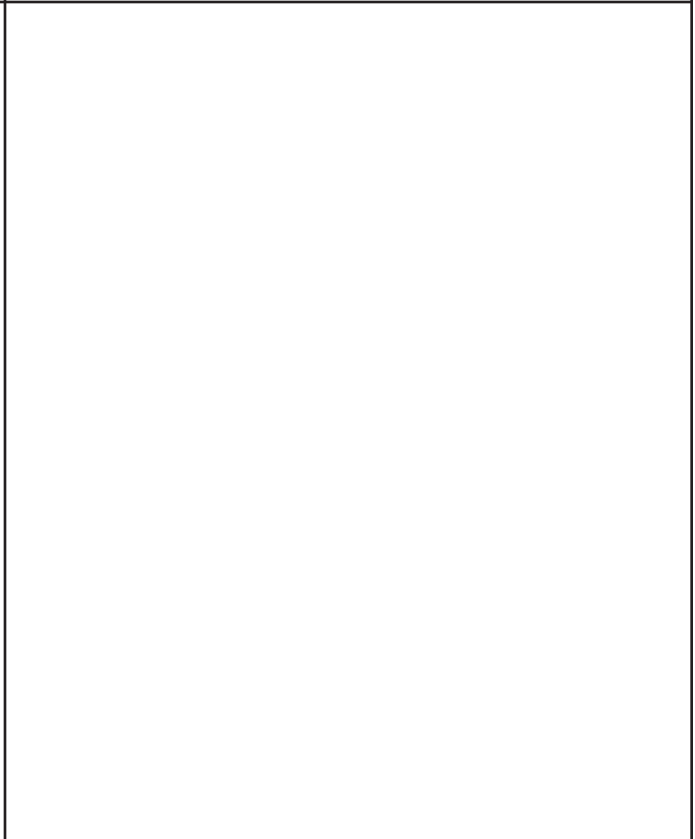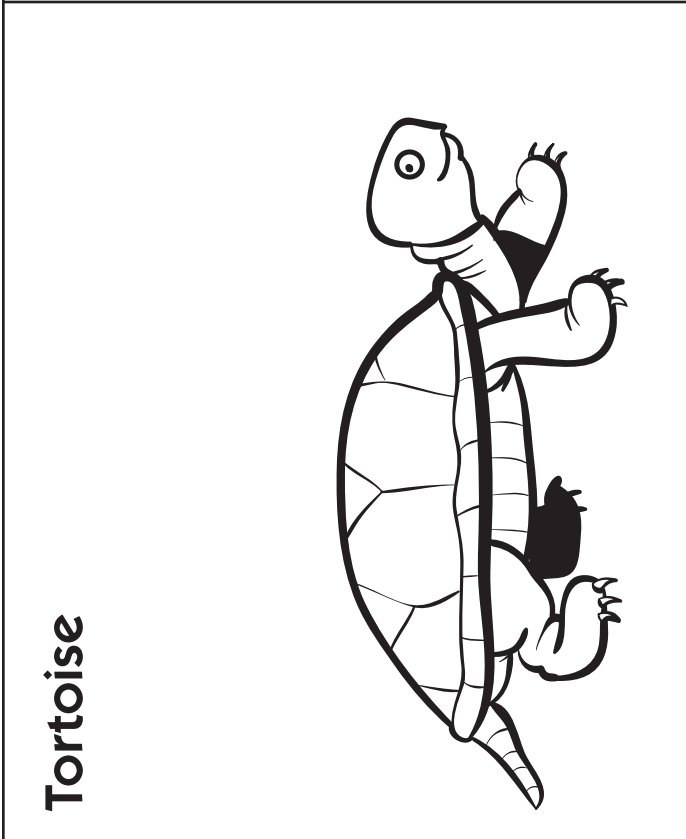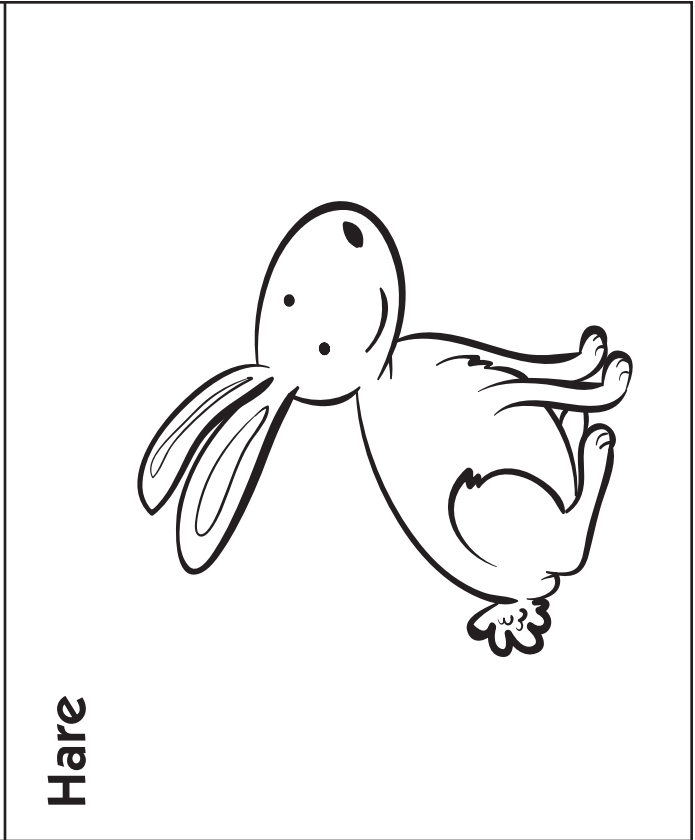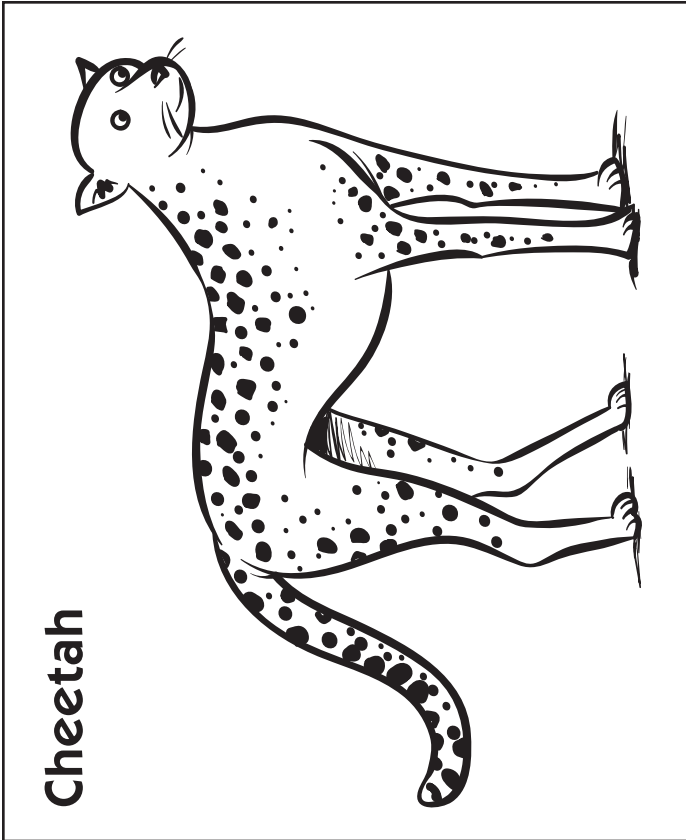
Set D6 ★ Activity 2

ACTIVITY

How Much Time?

Overview
This is a small-group activity in which students order the amount of time it takes to perform 3 or 4 simple tasks.

Skills & Concepts
★ compare and order events according to duration

You'll need
★ How Much Time? Task Cards (pages D6.7–D6.12, 1 copy of each, see Advance Preparation)

★ Animal Labels from Set D6 Activity 1

★ whiteboard and markers

★ masking tape

Advance Preparation Run 1 copy of each Task Card blackline on cardstock. Laminate the sheets if you want to and cut them apart to make a set of 24 cards.

Instructions for How Much Time?
1. Gather a small group of 6–9 children near the whiteboard. If you've removed the Animal Labels you posted for Set D6 Activity 1, put them back up. Then work with input from the children to label them as shown below.

Cheetah — Fastest / Least Amount of Time

Hare

Tortoise — Slowest / Most Amount of Time
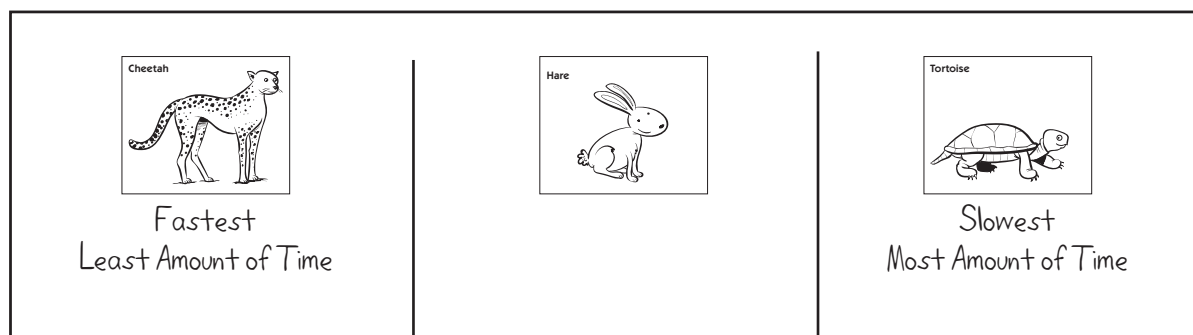
2. Show them the task cards and then spread the cards out face down on the floor or a table nearby.

3. Choose 3 students to start. Have all 3 of them pick up a card from the collection at random. Examine the 3 cards with the group and have the 3 children get anything they'll need to perform the specified tasks. Ask the group to predict which task will take the least time and which will take the most time to accomplish. Remind them that this is an experiment rather than a race, and they will need to do their best job with any card they draw when it's their turn.

4. At your signal, have all 3 students do their task at the same time as the others in the group watch. When they've completed their tasks, place each card on the ledge of the whiteboard under the correct label.

Activity 2 How Much Time? (cont.)

5. Repeat steps 3 and 4 until all the cards have been used up and all of the children have had several turns.

Extension
- Have groups of 4 students perform and order 4 tasks instead of 3. Make space between the Hare and the Tortoise label and work with student input to sketch in a fourth animal that runs faster than a tortoise, but not as fast as a hare. A rat would be one possibility, but your students may be able to think of others.

How Much Time? Task Cards page 1 of 6

Draw 3 triangles.
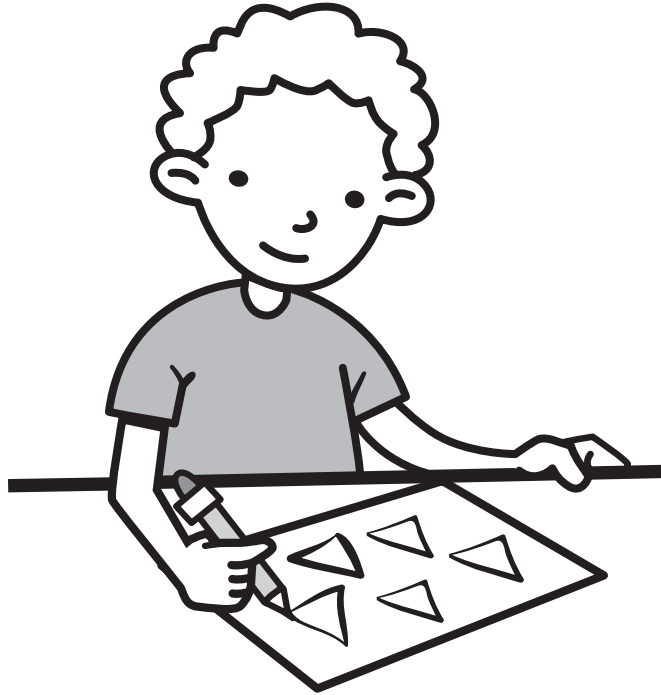
How Much Time? Task Card

10 20 30 40 50
60 70 80 90 100

How Much Time? Task Card
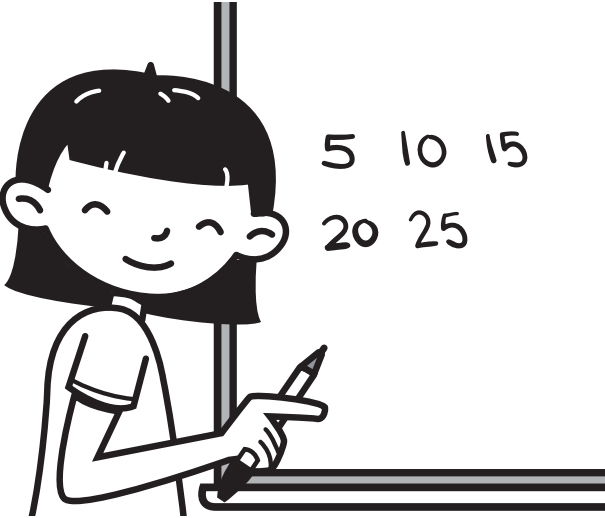
Draw a cat.
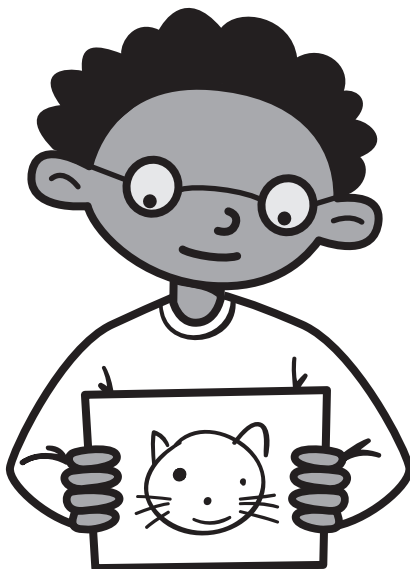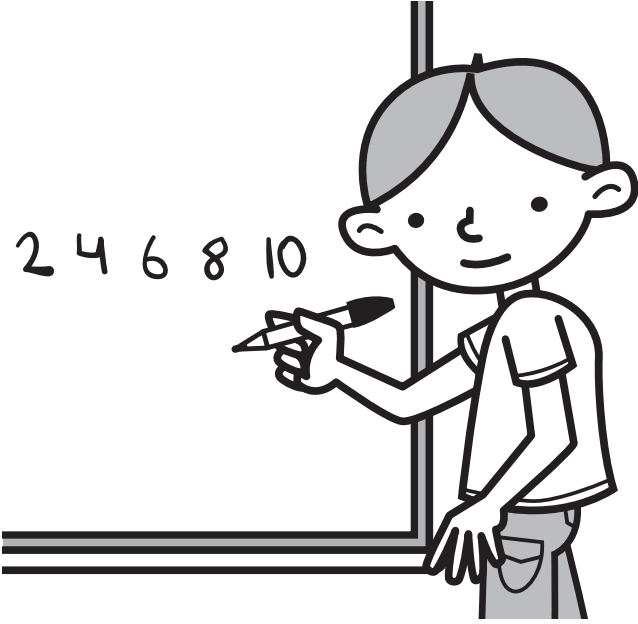
How Much Time? Task Card

12 long

How Much Time? Task Card

How Much Time? Task Cards page 2 of 6

2 4 6 8 10

How Much Time? Task Card

5 10 15
20 25

How Much Time? Task Card

How Much Time? Task Card

How Much Time? Task Card

How Much Time? Task Cards page 3 of 6

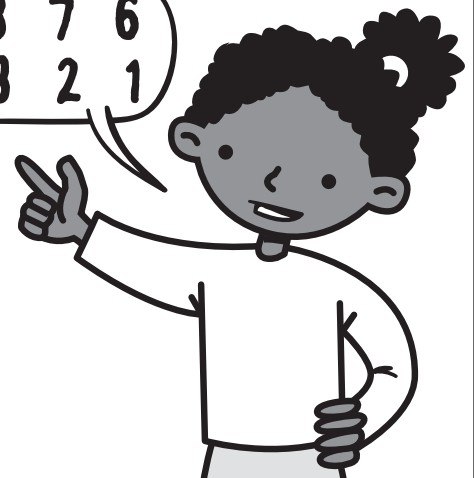Line up 16 bugs.

How Much Time? Task Card

Make a cube.

How Much Time? Task Card

A B C D E F G H I J K L
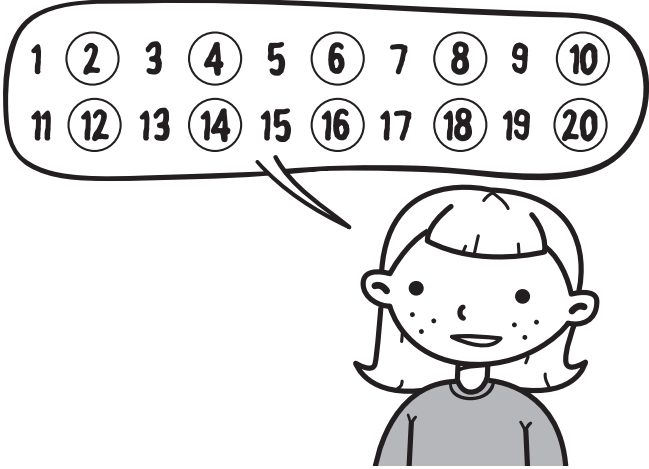M N O P Q R S T U V
W X Y Z

How Much Time? Task Card

10 9 8 7 6
5 4 3 2 1

How Much Time? Task Card
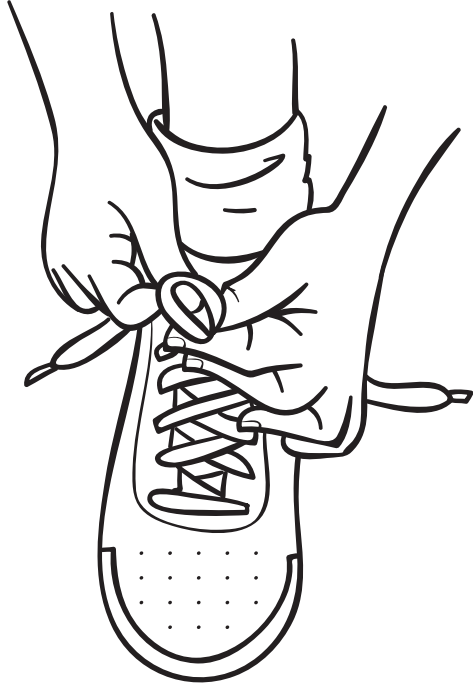
How Much Time? Task Cards   page 4 of 6

How Much Time? Task Card

How Much Time? Task Card

How Much Time? Task Card

Hop 9 times.

How Much Time? Task Card

How Much Time? Task Cards page 5 of 6

Stack 6 cubes.
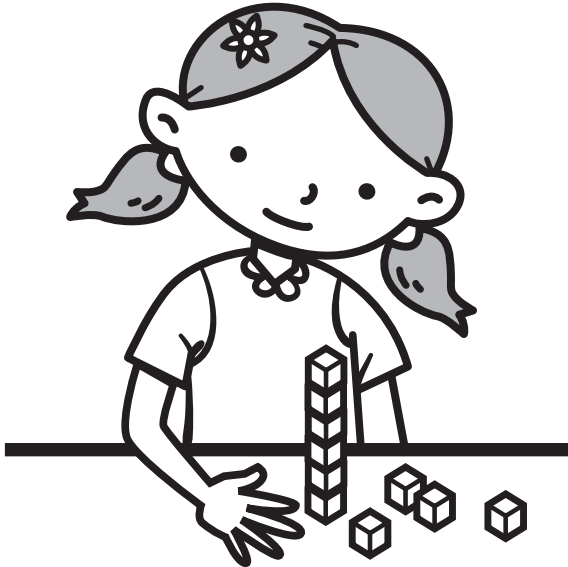
How Much Time? Task Card

Write your name.

Pete

How Much Time? Task Card

Get a drink.

How Much Time? Task Card

Draw 4 squares.

How Much Time? Task Card

How Much Time? Task Cards page 6 of 6

Jump 10 times.

How Much Time? Task Card

Wash your hands.

How Much Time? Task Card

How Much Time? Task Card

Fill a jar with rice.

How Much Time? Task Card

Set D6 ★ Activity 3

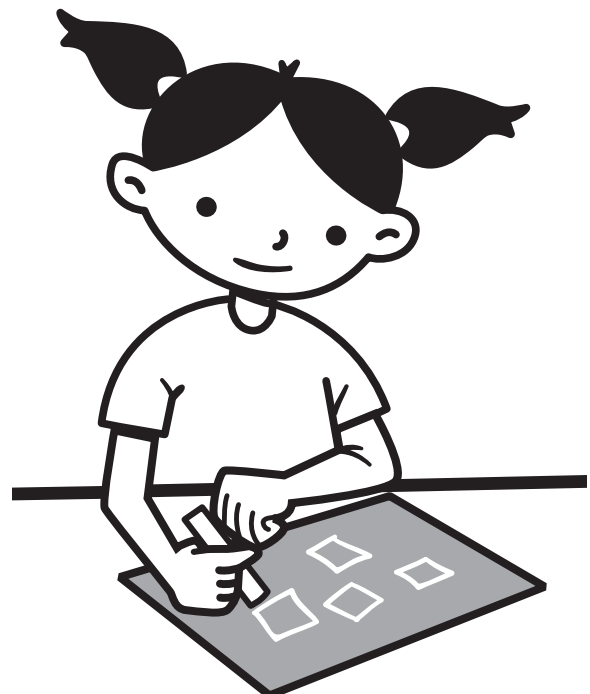**ACTIVITY**

Which One Sinks First, Second & Third?

Overview
In this Work Place or choosing time activity, students compare the amount of time it takes 3 metal jar lids with holes drilled in them to sink in a clear tub of water.

Skills & Concepts
★ compare and order events according to duration

You'll need
★ 18–21 metal jar lids of various sizes (see Advance Preparation)
★ clear tub of water (see Advance Preparation)
★ cafeteria tray
★ 2 towels for spills
★ 3 or 4 single-colored plastic place mats or 9″ × 12″ pieces of plastic cut from an old table cloth (see Advance Preparation)

....

Advance Preparation Use a hammer and a very large nail or a drill to make a hole approximately ⅛″ in diameter in the middle of each lid. To make the lids sink more easily, add a little liquid detergent to the water to break the surface tension. Use the 9″ × 12″ plastic place mats or pieces of plastic and a permanent felt marker to create 3 or 4 recording mats similar to the one shown here.

1st Place (fastest)	2nd Place	3rd Place (slowest)

....

Instructions for Which One Sinks First, Second & Third?
1. Set up the materials, as shown on the next page, in the middle of your discussion circle and invite your students join you. Model the activity as described in steps 2–6, and explain that the children will each have a turn (or more than one turn) to try it for themselves over the next few weeks. Then set the materials up on a table as a Work Place or choosing activity.

Activity 3 Which One Sinks First, Second & Third? (cont.)
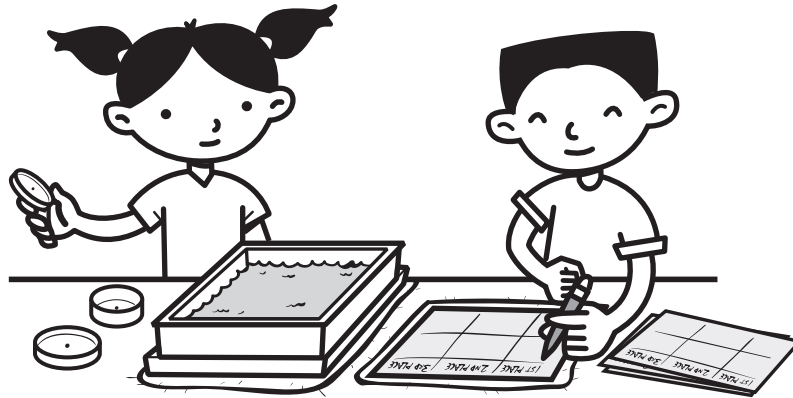
2. Choose 3 lids from the collection. Explain that you're going to choose a volunteer to help you set all 3 in the tub of water at the same time. Ask the children to predict which of the 3 lids will "win the race" by sinking the most quickly, which one will come in second, and which will take the longest to sink. As students share their thinking with the class, encourage them to explain their predictions.

> **Bianca** *I think the smallest one will sink first because it won't take very much water to fill it up, and then it'll sink.*

> **Esteban** *I think the big one will win the race because it's the heaviest, so it'll sink the quickest.*

3. Set the 3 lids on top of the water and watch to see which one sinks first, second, and third. (If one or more of the lids don't start sinking almost immediately, get all three of them completely wet and start over again.)

4. When all 3 lids have sunk to the bottom of the tub, remove them from the water. Dry them with one of the towels and place each where it belongs on the recording mat.

5. Repeat steps 2–4 with 3 different lids.
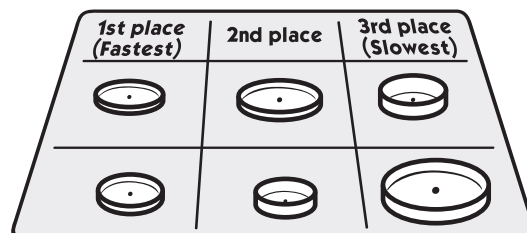
6. Can students discover anything that's the same about the lids that sink quickly and those that sink more slowly? Ask them to share their ideas, and encourage them to keep developing theories as they test the lids for themselves during Work Places.