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Fifth Grade
Math

Week of April 27, 2020
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5th Grade Math Week 4

In this lesson, you will look at expressions, patterns, and relationships between numbers to solve real-world problems. Look at this problem and one solution.

Intermission Snacks

Brandi is working with a theater group to plan their next show. She needs to decide what snacks to sell during intermission. Brandi lists the costs to buy or make each item. The selling price will be about 2 or 3 times the cost.

Our Costs	
Popcorn	$0.75
Trail Mix	$1.25
Hot Dog	$1.50
Sandwich	$2.00
Small Pizza	$2.50

Choose 2 food items. Decide on a selling price for each. Use ordered pairs to compare the amount of money they will take in by selling 0, 1, 2, 3, 4, and 5 of each item. Describe how the numbers in each ordered pair are related.

Look at Brandi's solution on the right to see how she did it. Can you do it a different way?

Brandi's Solution

Hi, I'm Brandi. Here's how I solved this problem.

▷ **I know** what each food item costs. I'll choose popcorn and trail mix because they seem like good snacks.

▷ **I also know** that the selling price should be about 2 or 3 times the cost. I can multiply each cost by both 2 and 3. I can use either of those products. Or I can find a number somewhere between the two products.

Item	Cost	Cost x 2	Cost x 3	My Selling Price
Popcorn	$0.75	$1.50	$2.25	$2.00
Trail Mix	$1.25	$2.50	$3.75	$3.00

I used a table so the money amounts are clearly labeled and easy to see.

▷ **I'll check** that the selling price is between 2 and 3 times the cost.

$2.00 > $1.50 and $2.00 < $2.25

$3.00 > $2.50 and $3.00 < $3.75

▷ **I can make a** table to find the price to buy 0, 1, 2, 3, 4, and 5 of each item.

Number of items	0	1	2	3	4	5
Price of Popcorn	0	2	4	6	8	10
Price of Trail Mix	0	3	6	9	12	15
Ordered Pair	(0, 0)	(2, 3)	(4, 6)	(6, 9)	(8, 12)	(10, 15)

I decided to use whole-dollar amounts so it will be easier to compare numbers.

▷ **I'll look at the ordered pairs** to see how the numbers are related. It looks like each second number is $1\frac{1}{2}$ times the first number.

$2 \times \frac{3}{2} = 3$ $4 \times \frac{3}{2} = 6$ $6 \times \frac{3}{2} = 9$ $8 \times \frac{3}{2} = 12$ $10 \times \frac{3}{2} = 15$

$1\frac{1}{2}$ is the same as $\frac{3}{2}$.

I'm right. The price of trail mix in each ordered pair is $1\frac{1}{2}$ times the price of popcorn.

Read the problem. Write a solution on a separate sheet of paper.
Remember, there can be lots of ways to solve a problem!

Printing Costs

Brandi is checking prices for printing programs for the play. The program will be printed as a booklet. Here is information from a printer's website.

PopularPress

Booklet Printing Prices

Number of Pages	Price Per Booklet
4	$1.50
8	$2.00
12	$2.75

Brandi is not sure how many pages to have in the program. She also needs to know how many programs to print. Her decision will be partly based on price.

What will it cost to print different numbers of booklets with different numbers of pages?

Plan It and Solve It **Find a solution to the Printing Costs problem.**

Compare the costs to print booklets with different numbers of pages.

- Choose two different size booklets.
- Find the cost of printing 1, 2, 3, 4, and 5 booklets with these number of pages.
- Make a graph to compare the costs.
- What is the relationship between the two numbers in each ordered pair? Write a statement to describe this relationship.

Reflect

Use Mathematical Practices As you work through the problem, discuss these questions with a partner.

- **Reason Mathematically** When you describe the relationship between corresponding terms, how do you know what operation to use?
- **Make Sense of Problems** How can the information in the problem help you choose the number of pages to use?

Read the problems. Write a solution on a separate sheet of paper.
Remember, there are many different ways to solve a problem.

Snack Discounts

Brandi does not want to have much leftover food when the play is over. She will check what is left about halfway through the intermission. If there is a lot of food left, Brandi will offer a discount.

Here are two discounts Brandi is considering.

- Pay $\frac{1}{2}$ of the total price if you buy two items.
- Pay $\frac{1}{4}$ of the total price if you buy four items.

Here is Brandi's regular price list.

Price List	
Popcorn	$2
Trail Mix	$3
Hot Dog	$4
Sandwich	$6
Small Pizza	$8

How much will it cost to buy different food items with the discounts?

Solve It **Help Brandi get an idea of what customers will pay for food with the discounts.**

- Choose two different combinations of items for each discount.
- Write an expression that can be used to find the total costs.
- Evaluate the expressions and show the total cost for each combination.

Reflect

Use Mathematical Practices After you complete the task, choose one of these questions to discuss with a partner.

- **Reason with Numbers** What do the numbers in your expressions mean in the context of the problem?
- **Repeated Reasoning** How did you calculate the fraction of a price? Explain.

Play Programs

Now Brandi is considering the size of the program.

Printing Costs

- $1.50 for each 4-page booklet
- $2.00 for each 8-page booklet

Brandi will double the printing cost to find the *selling price* of a program. The money she makes selling programs will be used to pay the printing costs. The money she has left is her *profit*.

Brandi needs to decide whether to make 4-page or 8-page programs. She thinks that she can sell more programs at a lower price. But she thinks she might make more profit with higher-price programs. Here are Brandi's sales estimates.

- I can sell 280 to 300 of the 4-page programs.
- I can sell 250 to 280 of the 8-page programs.

About how much profit might Brandi make selling programs? How many pages should the programs be?

Solve It **Help Brandi decide whether to make 4-page or 8-page programs.**

- Choose a number of 4-page programs and a number of 8-page programs from Brandi's sales estimates.
- Use these numbers to write and evaluate expressions that show how much profit Brandi will make after paying for the programs to be printed.
- Tell which page length Brandi should use and support your recommendation.

Reflect

Use Mathematical Practices After you complete the task, choose one of these questions to discuss with a partner.

- **Make an Argument** How did you support your recommendation?
- **Reason Mathematically** How did you choose the number of 4-page and the number of 8-page programs?

Possible Solutions

*Remember that with our Math in Action lessons there may be multiple solutions!

Intermission Snacks

I need to decide the selling prices for two snacks and use ordered pairs to compare the prices. The selling price is about 2 or 3 times the cost to make or buy each snack.

I will use trail mix ($1.25 cost) and sandwich ($2.00 cost).

$1.25 × 2 = $2.50 and $1.25 × 3 = $3.75

$2.00 × 2 = $4.00 and $2.00 × 3 = $6.00

Use selling prices of $3 for the trail mix and $5 for the sandwich. These prices are between 2 and 3 times the cost.

Here are prices for 0–5 of each item.

Items	0	1	2	3	4	5
Trail Mix	$0	$3	$6	$9	$12	$15
Sandwich	$0	$5	$10	$15	$20	$25
Ordered Pair	(0, 0)	(3, 5)	(6, 10)	(9, 15)	(12, 20)	(15, 25)

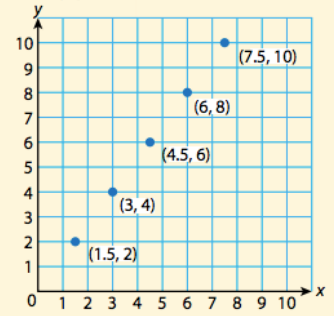
The second number is $\frac{5}{3}$ times the first number. $3 \times \frac{5}{3} = 5$, $6 \times \frac{5}{3} = 10$, $9 \times \frac{5}{3} = 15$, $12 \times \frac{5}{3} = 20$, and $15 \times \frac{5}{3} = 25$. So the price of a sandwich is $\frac{5}{3}$ times the price of trail mix.

Printing Costs

I will compare the costs to print booklets with 4 pages and 8 pages. Here are the prices and ordered pairs for 1–5 booklets.

Booklets	1	2	3	4	5
4-pages	$1.50	$3.00	$4.50	$6.00	$7.50
8-pages	$2.00	$4.00	$6.00	$8.00	$10.00
Ordered Pair	(1.5, 2)	(3, 4)	(4.5, 6)	(6, 8)	(7.5, 10)

Here is my graph.



The second number in each ordered pair is $\frac{4}{3}$ times the first number. The 8-page booklets cost $1\frac{1}{3}$ times as much as the 4-page booklets.

Snack Discounts

I need to write and evaluate expressions that show the cost of two combinations of discounted snacks.

Two-item Discount

Popcorn and Trail Mix	Sandwich and Pizza
$\frac{1}{2} \times (2 + 3) = \frac{1}{2} \times 5$ $\frac{5}{2} = 2\frac{1}{2}$ Cost = $2.50.	$\frac{1}{2} \times (6 + 8) = \frac{1}{2} \times 14$ $\frac{14}{2} = 7$ Cost = $7.00

Four-item Discount

Popcorn, Trail Mix, Hot Dog, and Sandwich	Pizza, Popcorn, Trail Mix, and Sandwich
$\frac{1}{4} \times (2 + 3 + 4 + 6)$ $\frac{1}{4} \times 15 = \frac{15}{4}$, or $3\frac{3}{4}$ Cost = $3.75.	$\frac{1}{4} \times (8 + 2 + 3 + 6)$ $\frac{1}{4} \times 19 = \frac{19}{4}$, or $4\frac{3}{4}$ Cost = $4.75

Play Programs

I need to decide how many pages the program should be and use expressions to show how much profit Brandi will make.

First, find the profit for selling 1 each of the different-size booklets. That is the selling price of 1 booklet minus the printing cost.

Booklet	Printing Cost	Selling Price	Profit for 1
4-page	$1.50	2 × $1.50 = $3	$3 − $1.50 = $1.50
8-page	$2.00	2 × $2.00 = $4	$4 − $2.00 = $2.00

I'll use the greatest sales estimate for 4-page booklets and the least sales estimate for 8-page booklets to calculate total profits. Again, I subtract the printing costs from the selling prices.

Profit from 300 four-page booklets

(300 × $3.00) − (300 × $1.50) = $900 − $450, or $450

Profit from 250 eight-page booklets

(250 × $4.00) − (250 × $2.00) = $1,000 − $500, or $500

The booklets should have 8 pages. Even if she sells the least amount she estimated for 8-page booklets, she will make more profit than if she got 4-page booklets and sold all of them.

Fifth Grade
Social Studies

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* There will be a short video lesson of a Knox County teacher to accompany this task available on the KCS YouTube Channel and KCS TV.

Fifth Grade Social Studies

Standard 5.29 Explain how the Cumberland Gap and Wilderness Road influenced migration into the Tennessee region following the Proclamation of 1763.
Standard 5.30 Explain the significance of the Watauga Settlement on Tennessee history, including the following: Watauga Compact, Dragging Canoe, John Sevier, and Nancy Ward.
Standard 5.31 Describe the founding of and the obstacles faced with the establishment of the Cumberland Settlements, including: the Battle of the Bluffs, John Donelson, and James Robertson.

SHOW WHAT YOU KNOW!

Last week we reviewed the Cumberland Gap, the Wilderness Road, and the Watauga and Cumberland Settlements. We also talked about John Sevier, Nancy Ward, Dragging Canoe, Little Carpenter, John Donelson, and James Robertson.

Based on the information you have about these people and the hardships and successes they experienced, create 2-3 questions you would ask them if you had the opportunity conduct an interview.
Use your background knowledge and information from the Gallopade text.
Be thoughtful and creative with your questions. Think about what you learned about the Proclamation and include information about how their actions may have had an effect on the expansion of land and settlements in what is now TN.

****As an added bonus, create what you believe would be the answers you would receive.**

The following is an example of an interview question for Nancy Ward:

Your goal was to maintain peace between the Cherokee and white settlers. How did you feel when you discovered that Dragging Canoe would be leading an attack against Watauga?

Fifth Grade
ELA

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Grade 5_ELA_Week 4

There will be a short video lesson of a Knox County 5th Grade Teacher to accompany this text available on the KCS YouTube Channel and KCS TV.

Tennessee's English Language Arts (ELA) standards ask students to read, talk, and write about a variety of texts. In this activity packet, your child will have the chance to do just that as they work to solve a mystery.

First, your child will encounter a letter introducing them to the idea of becoming a "Super Sleuthhound." You can discuss the picture clues – a camera, keys, flashlight, compass. Think about how these things might be tools for a detective or sleuth.

In this week's text, your child will be looking for specific clues about:
TOPIC: Adapting

ESSENTIAL QUESTION: How do people overcome obstacles?

Remind your child that people adapt in a variety of ways. If your child read last week's text, ask them how the person in the text adapted to a difficult situation. Tell them as they read this week, they'll be looking for clues to explain how people overcome obstacles.

You may choose to take turns reading the text with your child, read the text at the same time, or have your child read independently.

At the end of the text, there is a "Be a Sleuth" section containing questions to discuss and write about the text.

- Ask Questions – Suppose you have the opportunity to interview someone who has a monkey helper. List three questions that you would ask the person about his or her experience. (Make sure your questions cannot be answered with a simple yes or no.)
- Gather Evidence – List at least four text details that explain why monkey helpers are so good at their jobs.
- Make Your Case – Do you think capuchin monkeys make better service animals than dogs? Why or why not? Cite three reasons to support your opinion/argument. This question is a written task. Your child should be able to write a paragraph stating their opinion, supply reasons or evidence to support their opinion, and provide a conclusion or closing statement. They can also create an illustration of their writing.

OPINION WRITING EXEMPLAR

Based on "Helping Hands," I think capuchin monkeys make better service animals than dogs. First of all, monkeys are small. They would be able to fit in places where dogs might not fit. In addition, monkeys live to be thirty or forty years old. People wouldn't have to go through the trauma of losing their companion and having to wait on another helper. Most importantly, monkeys have hands! Because they have hands, they can pick up objects, cook food, and operate devices. Quadriplegics wouldn't be able to do those things for themselves, and dogs wouldn't be able to help in those ways either. As you can see, capuchin monkeys are better helpers than dogs.

EXTENSION IDEAS:
Research: Find out more information about capuchin monkeys, service dogs, or other service animals. You may be surprised what you find out!

1. Write an opinion paragraph about which type of service animal you think is best based on your research.
2. Use the success criteria we looked at in this video. It is also included in your packet for this week.

Fifth Grade
Science

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5th Grade Science: Week 4 April 27
Apparent Brightness and Size

Why Do Some Stars Appear to Have a Different Brightness to Our Sun?

Directions: To help you answer this important question, complete the following two investigations. Remember, our Sun is a star.

Investigation 1 - Same Size Circles

Materials:

- 3 circles (circle A, B, and C on the last page of this packet)
- 1 yellow crayon, pencil, or marker
- 3 cups or small sticks
- 3 pieces of tape
- Scissors

Directions:

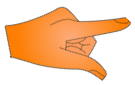
1. *Prediction*: What will three circles that are the same size look like at three different distances?

   _____

   _____

   Draw a picture below to show the three circles at different distances.

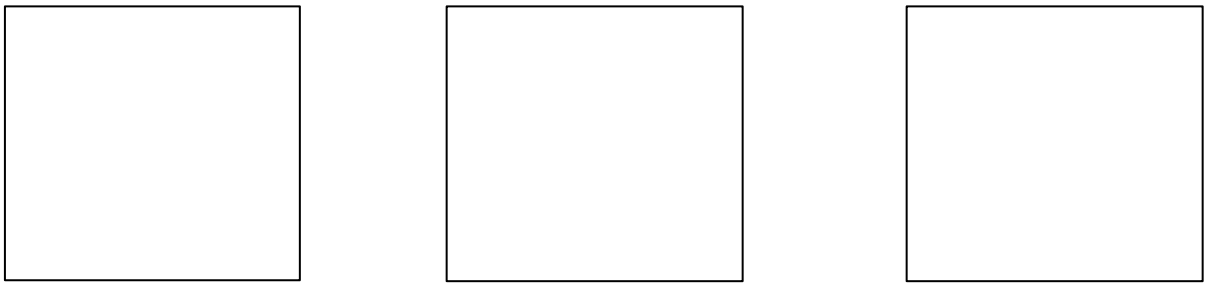
2. Cut out the three circles (A, B, and C). Color each circle the same color.
3. Tape each circle to a cup or small stick.
4. Go outside and mark a starting point.
5. Take 5 large steps from the starting point and place circle A on the ground. Take 5 more large steps and place circle B on the ground. Take 5 more large steps and place circle C on the ground.
6. Go back to your marked starting point.
7. *Data Collection:* You will now measure the size of each circle (A, B, & C). Extend your arm and hand out. Close one eye. Put circle A between your thumb and index finger. Without making your thumb and index finger wider or narrower, look at circle B between your thumb and index finger. What do you notice about circle B? Again, do not adjust your finger. Do the same with circle C. What do you notice about circle C? Write a statement that describes what you noticed when you measured A, B, and C.

   _____

Draw each of the circles as you see them between your finger and thumb.

A. B. C.



8. *Conclusion*: Make a claim about the circles at different distances. Support your claim with evidence from this investigation.

_____

_____

_____

Investigation 2 - Small and Large Circles

Materials:

- 1 small circle (circle D) and 1 large circle (circle A from Investigation 1)
- 1 yellow crayon or colored pencil
- Scissors

Directions:

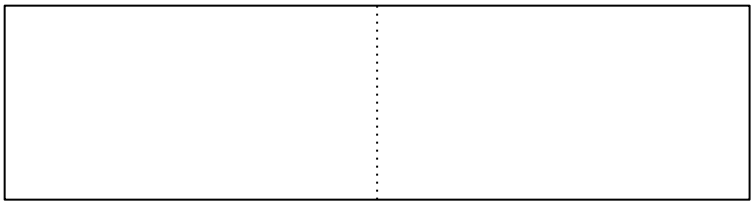
1. *Prediction*: How could you make a small circle look bigger than a larger circle without cutting or adding anything to it?

_____

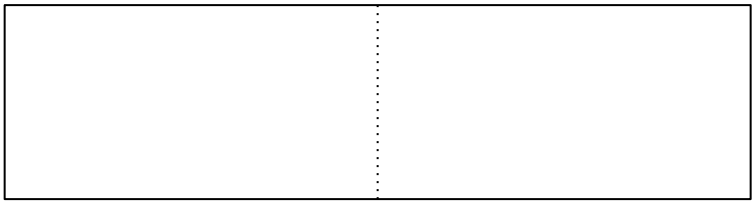
_____

Draw a picture below to show where you would put the small and large circle.

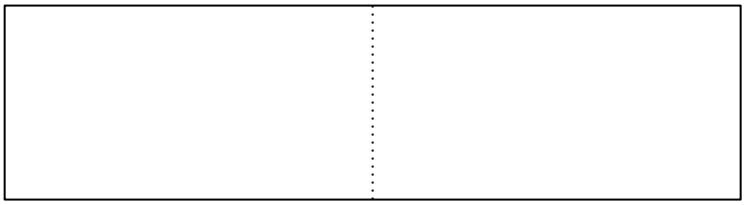
2. Cut out the small circle (D). Color the circle.
3. *Data Collection:* Put the large circle (A) in your left hand and the small circle (D) in your right hand. Extend both arms and hands so the circles are at eye level and the same distance from your eyes . Close one eye. Look at both with the other eye open. What do you notice about the two circles? Draw and label the two circles as you see them.



Extend both circles in front of you again. Move the small circle (D) away from you. What do you notice about the two circles? Draw a picture of what you see.



Now move the small circle (D) closer to you. What do you notice? Did the size of the smaller circle (D) appear to change or stay the same when you moved it?



5. *Conclusion*: Make a claim about how something smaller can appear to be bigger. Use evidence from this investigation to support your claim.

_____
_____
_____

Wrap It Up:

Remember, our Sun is much smaller than many of the stars we see in the night sky. Explain how our Sun could actually be smaller than those stars. Add any evidence from the investigations to support your claim.

_____

Investigation Circles

Cut out each circle.