



# Fourth Grade Math

Read this problem about comparing numbers. Then look at G.O.'s solution to this problem.

### Pine Cones and Needles

G.O. is with his friend Azul at a wildlife park. A worker at the nature center is arranging pine cones and pine needles in pairs for a display. Here are the rules.



#### Rules for Pairing Objects

- One length is a multiple of another length.
- The longer length is no more than 5 times the shorter length.
- Cones or needles can be paired with other cones or needles.

Kind of Tree	Sugar Pine	Jack Pine	Ponderosa Pine	Longleaf Pine
Cone Length	50 cm	5 cm	8 cm	24 cm
Needle Length	10 cm	4 cm	15 cm	40 cm

Use an object only once. Find three possible pairs of objects that fit the rules. Tell why these pairs work.

Look at G.O.'s Solution on the right to see how he did it. Can you do it a different way?

### G.O.'s Solution

- ▶ I already know that the length of one object in the pair has to be a multiple of the length of the other object. So one length is multiplied by a factor to get the other length as the product.
- ▶ I can think about any two numbers in the table.

I need to find pairs in which one number is a multiple of the other. I'll make a chart with some multiplication facts I can write using the lengths.

Shorter Length	x Number	Longer Length
10 cm	x 5	50 cm
5 cm	x 2	10 cm
5 cm	x 3	15 cm
8 cm	x 3	24 cm
4 cm	x 6	24 cm

The longer length is no more than 5 times the shorter length. These pairs all work.

24 is 6 times 4, and 6 times is more than 5 times. This doesn't work.

- ▶ Now I can pick three pairs that work and name the objects and lengths.

Pair 1:  
sugar pine needle (10 cm)  
sugar pine cone (50 cm)

Pair 2:  
jack pine cone (5 cm)  
ponderosa pine needle (15 cm)

Pair 3:  
ponderosa pine cone (8 cm)  
longleaf pine cone (24 cm)

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

I made a table to organize my thinking.

Here's my final answer.

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

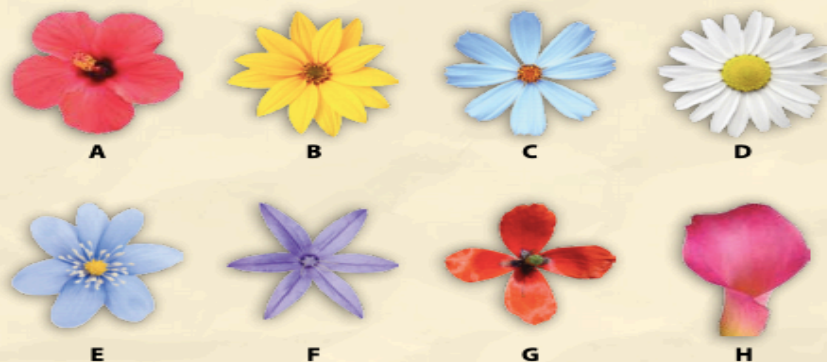
## Numbers in Nature

The nature center is planning a display called "Numbers in Nature." It will show animals and plants that represent different types of numbers.

### Number Categories

- Prime Numbers
- Composite Numbers
- Even Numbers
- Odd Numbers

One part of the display shows the number of petals that flowers have. G.O. is sorting these flowers into the number categories listed above.



How can G.O. arrange these flowers?

### Plan It and Solve It Find a solution to G.O.'s Numbers in Nature problem.

Help G.O. sort the flowers. Be sure to . . .

- find the number of petals each flower has.
- identify all the categories that each number fits in.
- study all the numbers and categories. Tell what you notice about how even and odd numbers relate to prime and composite numbers.

### Reflect

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

- **Use a Model** How can you create a model that will help you see the relationship between the different types of numbers?
- **Make an Argument** How can you justify the relationships that you describe?

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

## G.O.'s Planting Project

By the 1950s, almost all American chestnut trees in the country had been destroyed by a fungus. Now a conservation group plants groves of chestnut trees in suitable places. They hope the trees will make a strong comeback.

G.O. volunteers for a planting project at the park. Below is G.O.'s plan.

### My Planting Plan

- Plant 48 chestnut trees.
- Plant the trees in rows.
- Include an equal number of trees in each row.
- Plant a tree every 10 feet in the row.
- Leave 20 feet of space between rows.



How many rows of trees will G.O.'s plan make? How many trees are in each row?

### Solve It Describe a way to plant the 48 trees that works with the plan.

- Draw and label a diagram.
- Tell how many rows there are and how many trees are in each row.
- Tell the length and width of the rectangular area you need for your plan.
- Explain why your plan works.

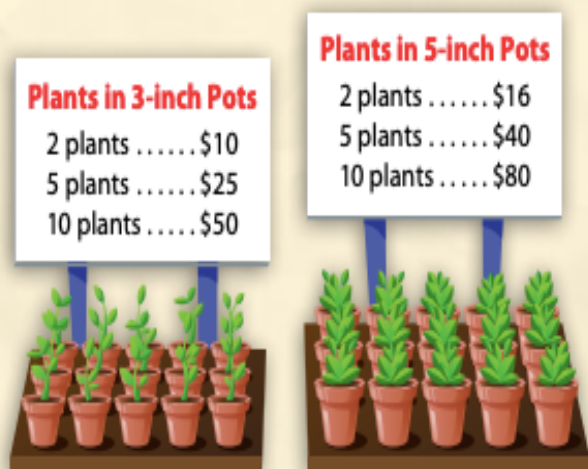
### Reflect

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

- **Make Sense of Problems** What was your first step in solving the problem? Why?
- **Use Tools** What tools did you use to help you find the length and width of the rectangular area?

## Plant Sale

G.O. has \$100 to spend on plants for the community center. He sees a plant sale in the park and checks out the prices.



What plants should G.O. buy for the community center?

**Solve It** Help G.O. decide which plants he should buy.

- Find the price of 1 plant of each size.
- Tell how many of each size plant G.O. should buy.
- Show that the total amount is within the money that G.O. has to spend.
- Explain why you chose these sizes and amounts.

### Reflect

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

- **Make Sense of Problems** How did you find the price of 1 plant of each size?
- **Check Your Answer** What did you do to make sure your answer works and makes sense?

## Possible Solutions

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

### Pine Cones & Needles

I need to find 3 pairs of lengths. In each pair, the longer length must be a multiple of the shorter length and cannot be more than 5 times the shorter length. I can only use an object once. I will list the 4 shortest lengths and find multiples that are 2, 3, 4, and 5 times the given length. Then I can circle the multiples that match a length of another object.

Lengths	Multiples
Jack pine needle = 4 cm	8, 12, 16, 20
Jack pine cone = 5 cm	10, 15, 20, 25
Ponderosa pine cone = 8 cm	16, 24, 32, 40
Sugar pine needle = 10 cm	20, 30, 40, 50

All of the circled lengths work, because they are 2, 3, 4, or 5 times the shorter length. So I will pick three pairs and show them in a table.

1	Jack pine needle = 4 cm	Ponderosa pine cone = 8 cm
2	Jack pine cone = 5 cm	Ponderosa pine needle = 15 cm
3	Sugar pine needle = 10 cm	Sugar pine cone = 50 cm

### Numbers in Nature

I need to find out how many petals each flower has and then say if these numbers are prime, composite, even, or odd. Then I have to tell how even and odd numbers relate to prime and composite numbers.

Even numbers have 2 as a factor. Odd numbers don't. Prime numbers only have themselves and 1 as factors. Composite numbers have other factors.

item	petals	even	odd	prime	composite
A	5		✓	✓	
B	13		✓	✓	
C	8	✓			✓
D	21		✓		✓
E	7		✓	✓	
F	6	✓			✓
G	4	✓			✓
H	1		✓		

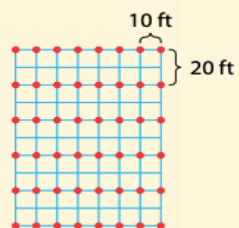
I noticed that none of the even numbers are prime. They are all composite. That's because each one has 2 as a factor. Most of these odd numbers are prime but one is composite.

1 isn't prime because its only factor is 1. But it isn't composite either. It's just odd.

### G.O.'s Planting Project

I have to make a plan for planting 48 trees in rows with the same number of trees in each row, with 10 feet between trees and 20 feet between rows.  $6 \times 8 = 48$ .

I will make a diagram to show 6 rows with 8 trees in each row. Each square represents an area 10 feet long and 10 feet wide.



I counted by 10s to find the length of the rectangular area: 10, 20, 30, 40, 50, 60, 70 feet. I counted by 20s for the width: 20, 40, 60, 80, 100 feet. Each row has an equal number of trees and the space between the trees fits the plan.

### Plant Sale

G.O. can spend up to \$100. I know the price of the plants. I need to find the price of 1 plant in a 3-inch pot and 1 plant in a 5-inch pot, tell how many of each kind G.O. should buy, and explain.

$2 \times \$5 = \$10$ ,  $5 \times \$5 = \$25$ , and  $10 \times \$5 = \$50$ , so 1 plant in a 3-inch pot costs \$5.

$2 \times \$8 = \$16$ ,  $5 \times \$8 = \$40$ , and  $10 \times \$8 = \$80$ , so 1 plant in a 5-inch pot costs \$8.

I like bigger plants, so I'm going to start with 10 of the bigger plants. That's \$80, so I have  $\$100 - \$80 = \$20$  left. I can get 4 plants in 3-inch pots for \$20 because  $4 \times \$5 = 20$ .  $\$80 + \$20 = \$100$ , so I have spent all of G.O.'s money.



# Fourth Grade Social Studies

## 4th Grade Social Studies - American Industrial Revolution Task #2

Directions: Read the following text and question prompt about mass production during the American Industrial Revolution. After thinking about how you would respond to the prompt, answer the question based on the perspective of each person listed below.

Before the Industrial Revolution, people couldn't just run to the store if they needed something. Instead, they knew how to make and repair most of the things they used at home. If they couldn't make a thing themselves, they took it to someone in town to make it for them. If someone in the family needed clothes, the mother of the family might go to a store to buy fabric. Then, she took the fabric home and made the clothes herself. If the family was rich, they might hire a seamstress or tailor to make the clothes. That's how it had been for generations.

But the Industrial Revolution changed it all! The sewing machine came along in 1846. Soon, factories could make clothes faster and more cheaply than it could be made at home. Families bought clothing from stores or through catalogs. It saved them time and money, and gave them more styles of clothes to choose from.

Clothes weren't the only thing that changed during the Industrial Revolution. Machines were able to make all kinds of things. They made tools, farm equipment, chairs, tables, beds, vehicles, and more! Stuff that had always been made slowly by hand could be made quickly by machines. It was called "mass production."

As mass production became more popular, fewer and fewer people worked on farms, and more and more people worked in factories. People who had lived in the country moved to the city. That way, they could be close to where the factories were. The way people lived and worked had changed forever.

-Excerpt from *Social Studies Weekly*

### Question Prompt:

The technology that made mass production easy caused many people to rely on machines to make their goods, rather than learning to make things themselves. If machines can do so much, do you think it's important for people to continue to learn to make or repair their own belongings? Why or why not? Answer from each of the perspectives listed below.

- A factory worker during the Industrial Revolution
- A pioneer moving West during the early 1800s
- A Native American living in the New World when Columbus arrived
- A person living on Mars in the future



# Fourth Grade

## ELA



## Grade 4.ELA.Week 2

There will be a short video lesson of a Knox County 4<sup>th</sup> Grade Teacher to accompany this text available on the KCS YouTube Channel and KCS TV.

**TOPIC:** Mysteries and Puzzles - Sleuth Tips and Letter

**ESSENTIAL QUESTION:** Why can't you always believe what you think you see?

**TEXT:** "Don't Believe What You See"

Discuss what you might remember about these key vocabulary words before reading. Revisit them after reading to see if you learned any new information: optical illusions, mirage, blend, brainteasers

### **Questions for discussion:**

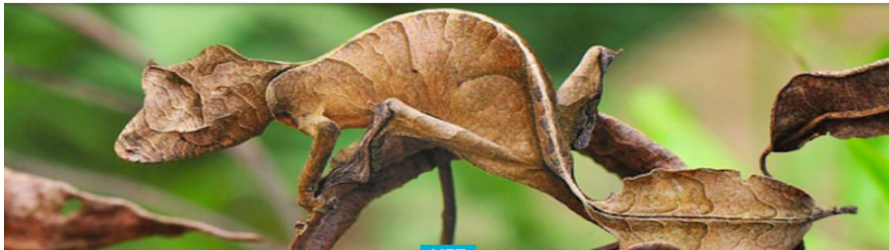
- Explain what an optical illusion is in your own words.
- What were the examples of optical illusions in nature?
- Describe how humans have created brainteasers.

### **SUMMARY:**

- Topic/ Conclusion sentences
  - Key details/ Examples
  - "Voice"-Your own explanation or elaboration of key details
  - Topic vocabulary and varied transition words
- \*\*Make sure to proofread your paragraph. Highlight or underline the different components with different colors.

### **EXTENSION ACTIVITY:**

- Research an animal that uses optical illusions in nature. See the one below as an example.



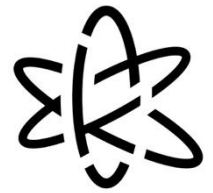
Some questions to research:

- How does your animal use optical illusion?
  - Why does your animal use optical illusions?
  - Is there a specific term that labels your animals optical illusion strategy?
- What can you do with your information?
- Summary
  - Google Slides
  - Informational Poster



# Fourth Grade Science

# Grade 4 Science: Week 2, April 13<sup>th</sup>



**Essential Question:** *What causes cracks in the street and the sidewalk?*



**Directions:** You will investigate plants growing outside to collect evidence that plants can cause weathering.

## Make a Prediction

What evidence do you think you will observe that could show how vegetation can cause weathering?

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## Carry Out an Investigation

1. Go outside and look for plants growing in paved areas such as your driveway or sidewalks.  
**\*Please make sure you do this WITH AN ADULT.\***
2. Look closely at how the plants are growing. Observe the effects the plants are having on the area.
3. Record Data Record your observations in the table on the activity sheet. Be sure to make note of the location of where you found the plants.
4. Record Data: Try to locate two more plants growing in different areas. Record your observations in the table

**Plant Location**

**Observations**

1	
2	
3	

## Communicate Information

7. **Construct an Explanation** Using the data that you collected, explain how vegetation can cause weathering.

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8. How did your prediction compare with what you observed?

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**Directions:** Read the Text Below to find out more about weathering.

### Physical Weathering

Rocks can change size and shape over time without changing their chemical properties by breaking apart. This process is called physical weathering. **Weathering** is the breaking down of rocks into smaller pieces over a long period of time. Plants, animals, gravity, rain, flowing water, wind, and ice are some of the main contributors of weathering.

### How Animals Contribute to Weathering

Animals that burrow into the ground contribute to physical weathering by loosening soil and breaking rocks apart as they move and dig. Some examples of burrowing animals include prairie dogs, gophers, moles, and rabbits. Larger animals, like bears, are also known to burrow into the ground to build dens for hibernation. Even small animals like worms and ants that burrow into the soil contribute to weathering!

## How Vegetation Contributes to Weathering

**Vegetation** is the variety of plants in a region. The type of vegetation you may find in mountainous areas would be large pine, birch and oak trees, while in a hot, sandy desert region, you would see plants like cacti and thorny bushes. In the mountains, the roots of larger types of vegetation can begin to grow into and through cracks in rocks. As this happens, over time, the roots begin to pry the cracks open, breaking the rocks apart or into smaller pieces. Once rocks begin to break apart and shift, rockslides are more apt to happen due to the additional force of gravity pulling the rocks and soil down the mountainside.

### Vocabulary

**weathering**: the breaking down of rocks into smaller pieces

**erosion**: the weathering and removal of rock and soil

**vegetation**: the variety of plants in a region

### Example Test Question

Which is an example of a living thing causing weathering?

- flowing water making rocks smooth
- water and carbon dioxide changing limestone
- tree roots forcing open cracks in rocks
- freezing and melting causing cracks in rocks

