Dinosaur Measurement

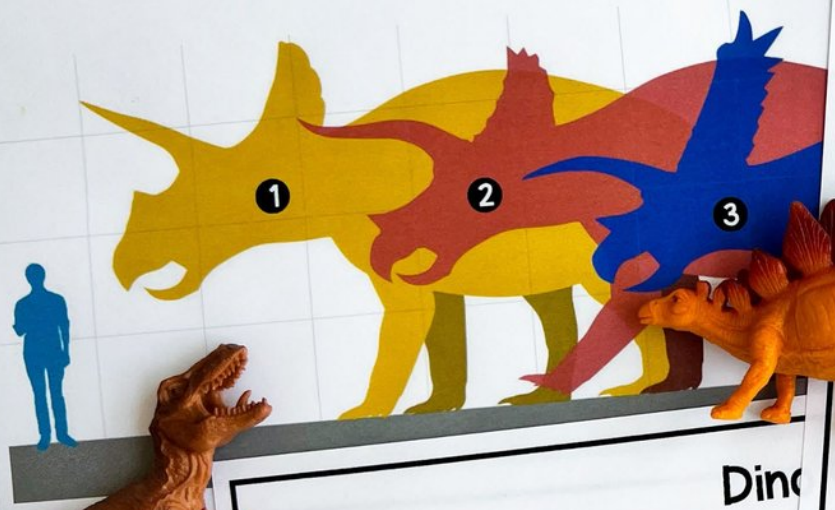
Project Based Learning

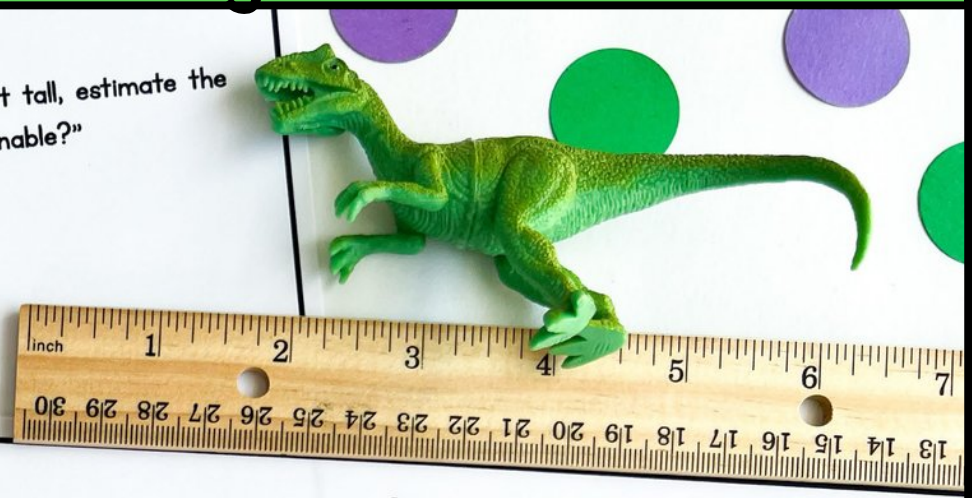
1st Grade Print & Google Slides

Dino Estimation

Look at this diagram of dinosaur heights. If the man in the diagram is about six feet tall, estimate the height in feet of each dinosaur group. Be sure to ask yourself, "Is my estimation reasonable?"

1. Eotriceratops = 14 feet tall
2. Triceratops = 12 feet tall
3. Pentaceratops = 13 feet tall
4. Chasmosaurus= 7 feet tall





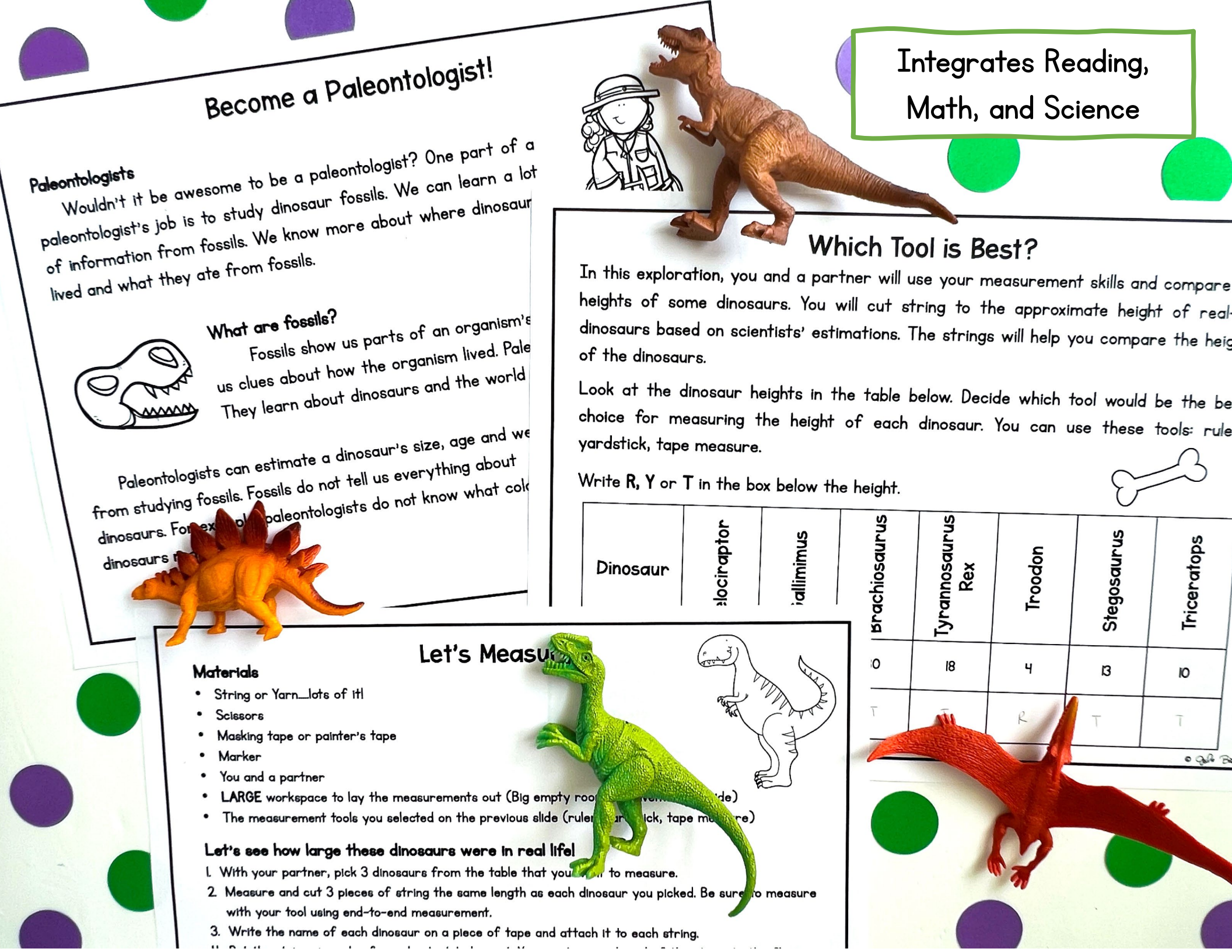
Dino Estimation

Look at this diagram of dinosaur heights. If the man in the diagram is about six feet ta
height in feet of each dinosaur group. Be sure to ask yourself, "is my estimation reason

1. Supersaurus vivianae = 15 feet tall
2. Shantungosaurus giganteus = 41 feet tall
3. Spinosaurus aegyptiacus = 18 feet tall
4. Stegosaurus ungulatus = 12 feet tall
5. Triceratops prorsus = 12 feet tall

Now it is time to compare your height to

Integrates Reading, Math, and Science



Become a Paleontologist!

Paleontologists

Wouldn't it be awesome to be a paleontologist? One part of a paleontologist's job is to study dinosaur fossils. We can learn a lot of information from fossils. We know more about where dinosaur lived and what they ate from fossils.

What are fossils?

Fossils show us parts of an organism's us clues about how the organism lived. Pale They learn about dinosaurs and the world

Paleontologists can estimate a dinosaur's size, age and we from studying fossils. Fossils do not tell us everything about dinosaurs. For ex paleontologists do not know what col dinosaurs

Which Tool is Best?

In this exploration, you and a partner will use your measurement skills and compare heights of some dinosaurs. You will cut string to the approximate height of real dinosaurs based on scientists' estimations. The strings will help you compare the heig of the dinosaurs.

Look at the dinosaur heights in the table below. Decide which tool would be the be choice for measuring the height of each dinosaur. You can use these tools: rule yardstick, tape measure.

Write **R, Y** or **T** in the box below the height.

Dinosaur	elociraptor	allimimus	Brachiosaurus	Tyrannosaurus Rex	Troodon	Stegosaurus	Triceratops
			0	18	4	13	10
			T	T	R	T	T

Let's Measu

Materials

- String or Yarn_lots of it!
- Scissors
- Masking tape or painter's tape
- Marker
- You and a partner
- **LARGE** workspace to lay the measurements out (Big empty roo de)
- The measurement tools you selected on the previous slide (rule ick, tape me re)

Let's see how large these dinosaurs were in real life!

1. With your partner, pick 3 dinosaurs from the table that you to measure.
2. Measure and cut 3 pieces of string the same length as each dinosaur you picked. Be sure to measure with your tool using end-to-end measurement.
3. Write the name of each dinosaur on a piece of tape and attach it to each string.

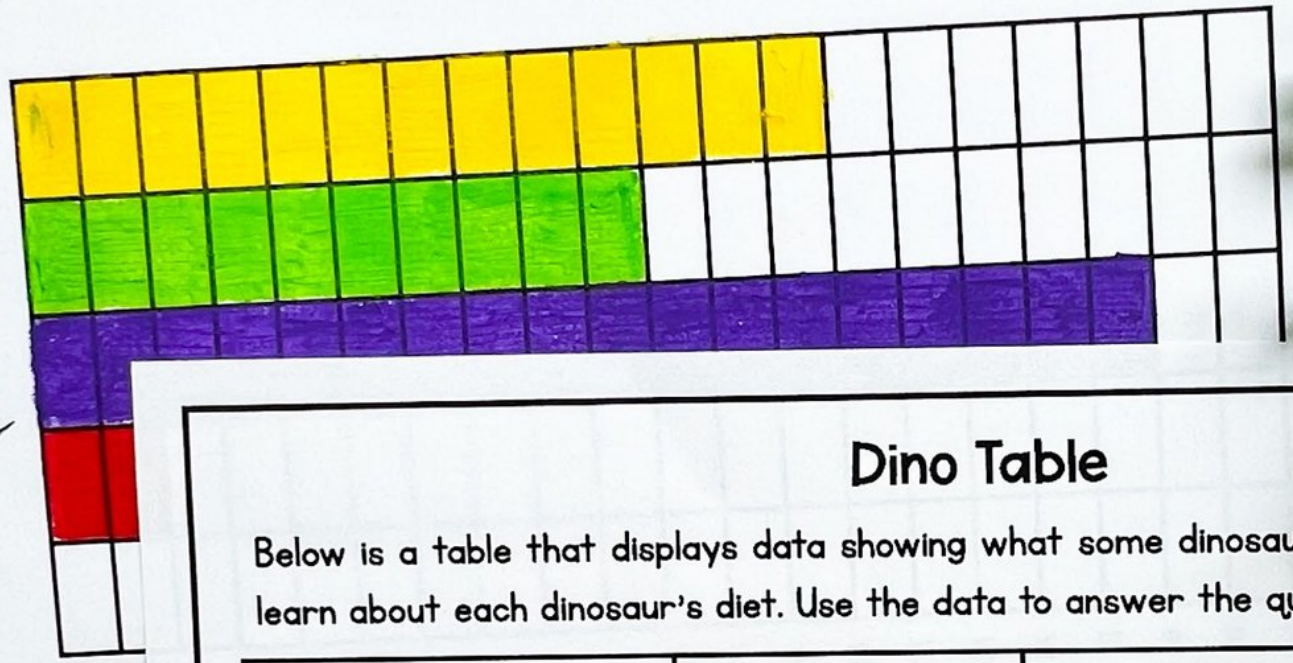
Dino Bar Graph

Complete the bar graph by coloring squares in each row that show the height of each dinosaur. In the last row, color in the correct number of squares to show your height to the nearest foot.

Dinosaur	in feet
Stegosaurus	13
Triceratops	10
Tyrannosaurus Rex	18
Velociraptor	2



Me







Dino Table

Below is a table that displays data showing what some dinosaurs ate. Rea[illegible]able to learn about each dinosaur's diet. Use the data to answer the questions below.

Carnivore Eats Only Meat	Velociraptor	T-Rex	
Herbivore Eats Only Plants	Triceratops	Stegosaurus	Brachiosaurus
Omnivore Eats Both	Troodon	Gallimimus	

1. What is the difference between the number of dinosaurs [illegible] who are herbivores? Write an equation to show your math

   3 - 2 = 1

2. Which two types of diets have an equal number of dinosa[illegible]

Integrates measurement and graphing standards.

Dino Groups

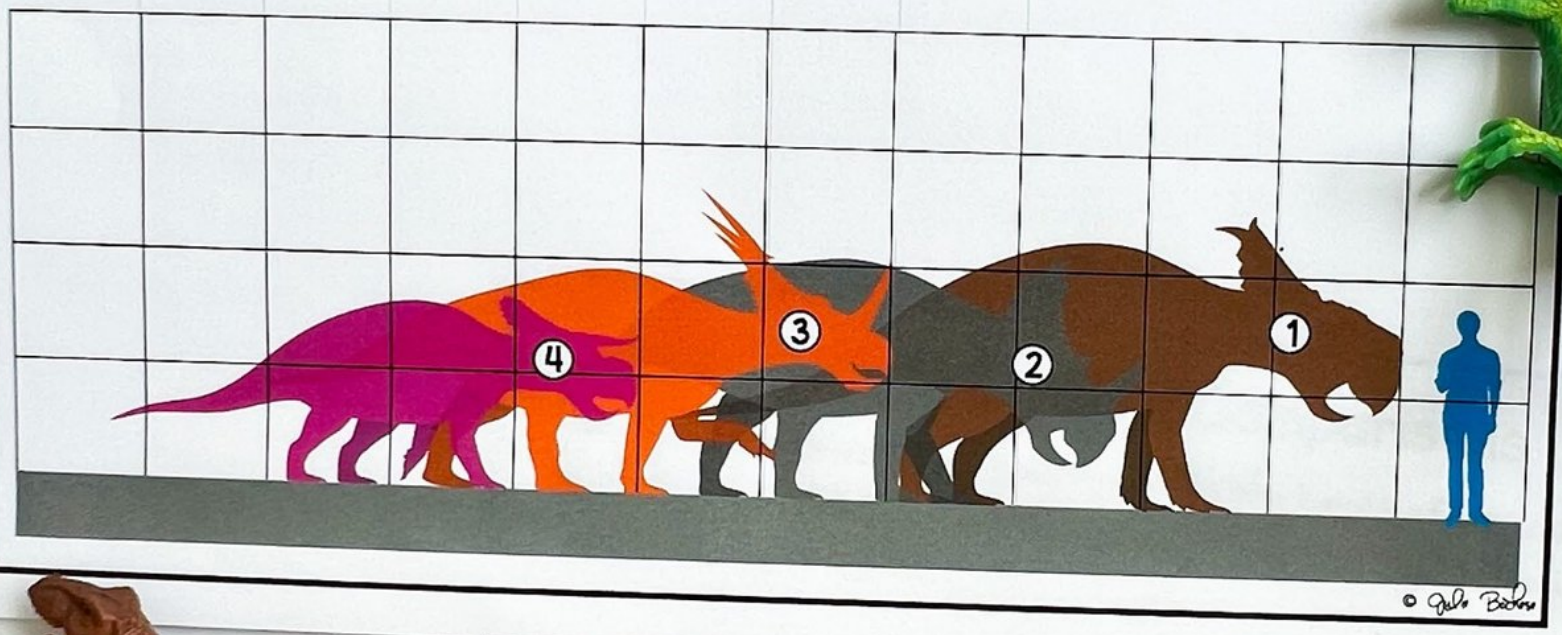
Look at this diagram of dinosaur heights. If the man in the diagram is about six feet tall, about how tall is each of the dinosaur groups? Use the grid lines to help you decide. Be sure to ask yourself, "Is my answer reasonable?"

❶ Pachyrhinosaurus = 10 feet tall

❷ Centrosaurus = 8 feet tall

❸ Styracosaurus = 7 feet tall

❹ Nasutoceratops = 5 feet tall







osaur. Write the height of
e (in feet) between your

Dinosaur	Height in feet	My heigh neares
Velociraptor	2	
Troodon	4	
Gallimimus	9	
Triceratops	10	
Stegosaurus		



Compare dinosaur heights.

Challenge 2 → More Dino Word Problems

…t Foot." These were meat-eating dinosaurs
… feet with three toes and sharp claws.
… one of the largest Theropod footprints
…e T-Rex. It measures over 30 inches long.



… floor using tape and a yardstick. Walk heel to toe a length of
…many of your feet would fit inside one T-Rex footprint?

…professional basketball. It is said that he had the largest
…ore a size 22 sneaker and his feet measured
… feet fit into one T-Rex footprint heel to toe?

…into one T-Rex footprint.

Super Challenge 1 → More Dino Word Problems

Imagine walking along the beach with your parents and finding a 220-million-year-old fossil of a dinosaur footprint. That is just what happened to 4-year-old Lily Wilder in January 2021. The footprint she found is only four inches long. It will be placed in the National Museum with Lily's name printed right next to it!



Scientists believe that for every inch a dinosaur track is from heel to toe, it is equal to 12 inches in height of that dinosaur. That means if a dinosaur was 12 inches tall, its footprint would have been about 1 inch long.

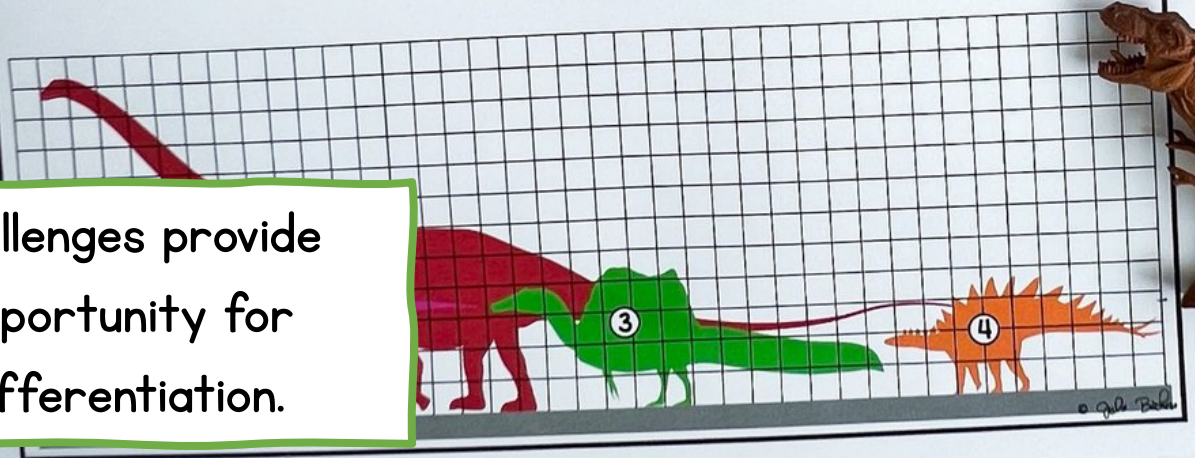
Meas… …f…
how …

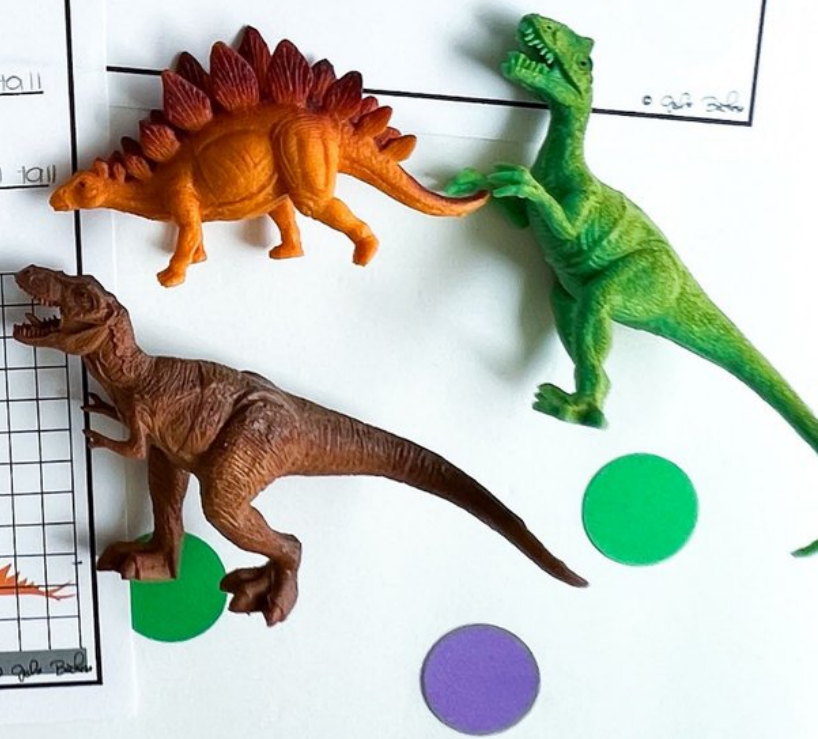
Challenge 3 → More Dino Estimation

Look at this diagram of dinosaur heights. If the man in the diagram is about six feet tall, about how tall are each of the dinosaur groups? Use the grid lines to help you with your answer. Be sure to ask yourself, "Is my answer reasonable?"

❶ Shantungosaurus giganteus = 15 feet tall ❷ Supersaurus vivianae = 43 feet tall

❸ Spinosaurus aegyptiacus = 16 feet tall ❹ Stegosaurus ungulatus = 12 feet tall





Challenges provide opportunity for differentiation.

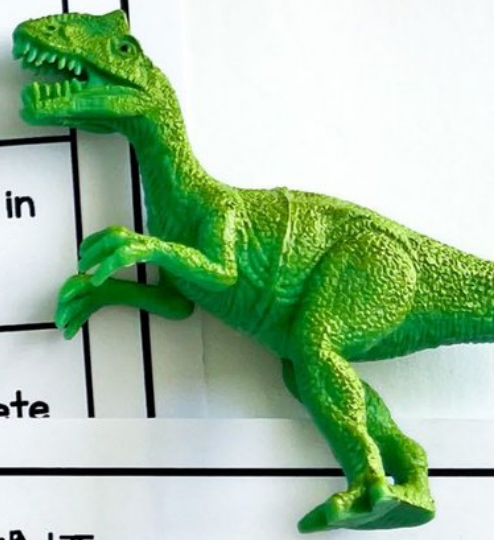
Rubric

elf-Evaluation Rubric: Highlight or shade the parts of the rubric that express
ow you rate yourself on this Project Based Learning Activity.

⊕	✓	⊖
I felt very confident.	I felt good about most the the math.	I felt a lot of the math in was too hard for me.
I did not need math pr		
I used strat		
I am		







DINOSAUR MEASUREMENT

Self Reflection: Write a reflection of your experience with this project. How did you feel about the math problems and activities? What did you find easy? Did you find anything hard to do? Did you enjoy this activity? Why or why not?

I liked this activity because I love dinosaurs and I like measuring things, which is v
activity easy.

Overall, I enjoyed this activity because it was fun.

Student rubric and reflection.

Google Slides

Dino Bar Graph

Complete the bar graph by coloring squares in each row that show the height of each dinosaur. To color the squares, click on the colored block and drag to resize. In the last row, color in the correct number of squares to show your height to the nearest foot.

Dinosaur	Height in feet
Stegosaurus	13
Triceratops	10
Tyrannosaurus Rex	18
Velociraptor	2






Me

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Height in feet

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For the teacher:

Dinosaur Measurement is a project-based learning task that asks students to solve dinosaur themed problems using the CCSS math standards with a focus on Measurement and Data. It is created for students in first grade but can be used for differentiation in grade 2. It includes extra challenge activities. The following standards are addressed:

Measure lengths indirectly and by iterating length units.

- **1.MD.A.1** Order three objects by length; compare the lengths of two objects indirectly by using a third object.
- **1.MD.A.2** Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.

Represent and interpret data

- **1.MD.C.4** Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Represent and solve problems involving addition and subtraction.

- **1.OA.A.1** Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.[1]
- **1.OA.A.2** Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Directions:

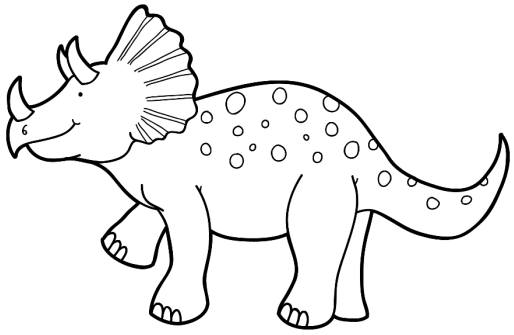
1. Assign students to work with a partner.
2. Preview the activity with your students.
3. Allow students class time to complete the activity. This can span over several days.
4. Students have an opportunity to complete extra challenge activities.
5. Students will complete the self-evaluation reflection and evaluation rubric.
6. Allow students an opportunity to share their completed projects.

Dinosaur Measurement

You have been hired as a paleontologist to study dinosaur measurement. Your job is to go into the field and use data from paleontologists to compare the heights of various dinosaurs.

Here are your tasks:

- Read through the entire packet before beginning.
- Read the informational slide called "Become a Paleontologist" to learn about their job.
- Determine the best measurement tools to use for measuring dinosaur heights.
- Measure, cut and compare lengths of string based on the estimated height of dinosaurs.
- Estimate heights of dinosaur types.
- Measure your height and compare to the heights of the dinosaurs.
- Read and answer dinosaur word problems.
- Create a line plot and a bar graph based on your data.
- (Optional) Complete the challenge activities.
- Complete the self-reflection and evaluation rubric.



Become a Paleontologist!



Paleontologists

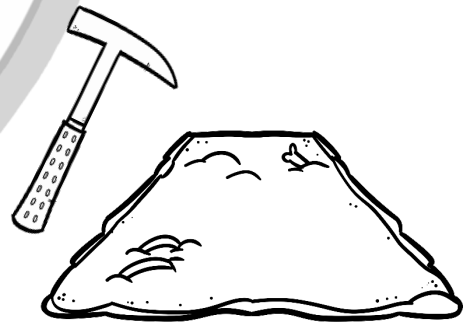
Wouldn't it be awesome to be a paleontologist? One part of a paleontologist's job is to study dinosaur fossils. We can learn a lot of information from fossils. We know more about where dinosaurs lived and what they ate from fossils.



What are fossils?

Fossils show us parts of an organism's body. Some fossils give us clues about how the organism lived. Paleontologists study fossils. They learn about dinosaurs and the world long ago.

Paleontologists can estimate a dinosaur's size, age and weight from studying fossils. Fossils do not tell us everything about dinosaurs. For example, paleontologists do not know what color dinosaurs really were.



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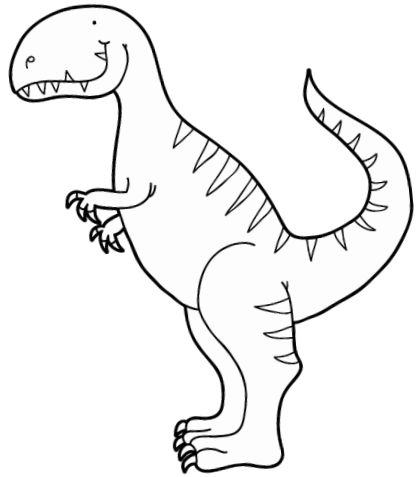
Let's Measure!



Materials

- String or Yarn.....lots of it!
- Scissors
- Masking tape or painter's tape
- Marker
- You and a partner
- **LARGE** workspace to lay the measurements out (Big empty room or pavement outside)
- The measurement tools you selected on the previous slide (ruler, yardstick, tape measure)

Let's see how large these dinosaurs were in real life!

1. With your partner, pick 3 dinosaurs from the table that you want to measure.
2. Measure and cut 3 pieces of string the same length as each dinosaur you picked. Be sure to measure with your tool using end-to-end measurement.
3. Write the name of each dinosaur on a piece of tape and attach it to each string.
4. Put the strings in order from shortest to longest. You can tape each end of the string to the floor.
5. Take turns with your partner and measure your heights to the nearest inch.
6. Cut the strings for your height and your partner's height.
7. Place both of your strings where they fall in the order of dinosaur heights.

My height:

My partner's height:

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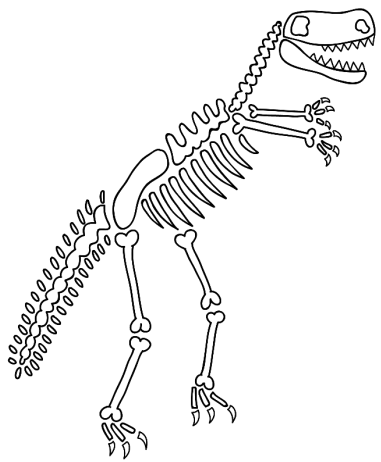
Using a Yardstick

You and your partner will continue practicing your measurement skills. You will use a ruler and a yardstick to do this activity. Measure out the length of each dinosaur using a ruler. Mark the floor to show where you began and where you end with a piece of tape. Now, use the yardstick to measure the same lengths. Write the number of yards in the table.



Dinosaur	Gallimimus	Brachiosaurus	Tyrannosaurus Rex
Height in feet	9	30	18
Number of yards			

Why is the number of yards less than the number of feet for each dinosaur?

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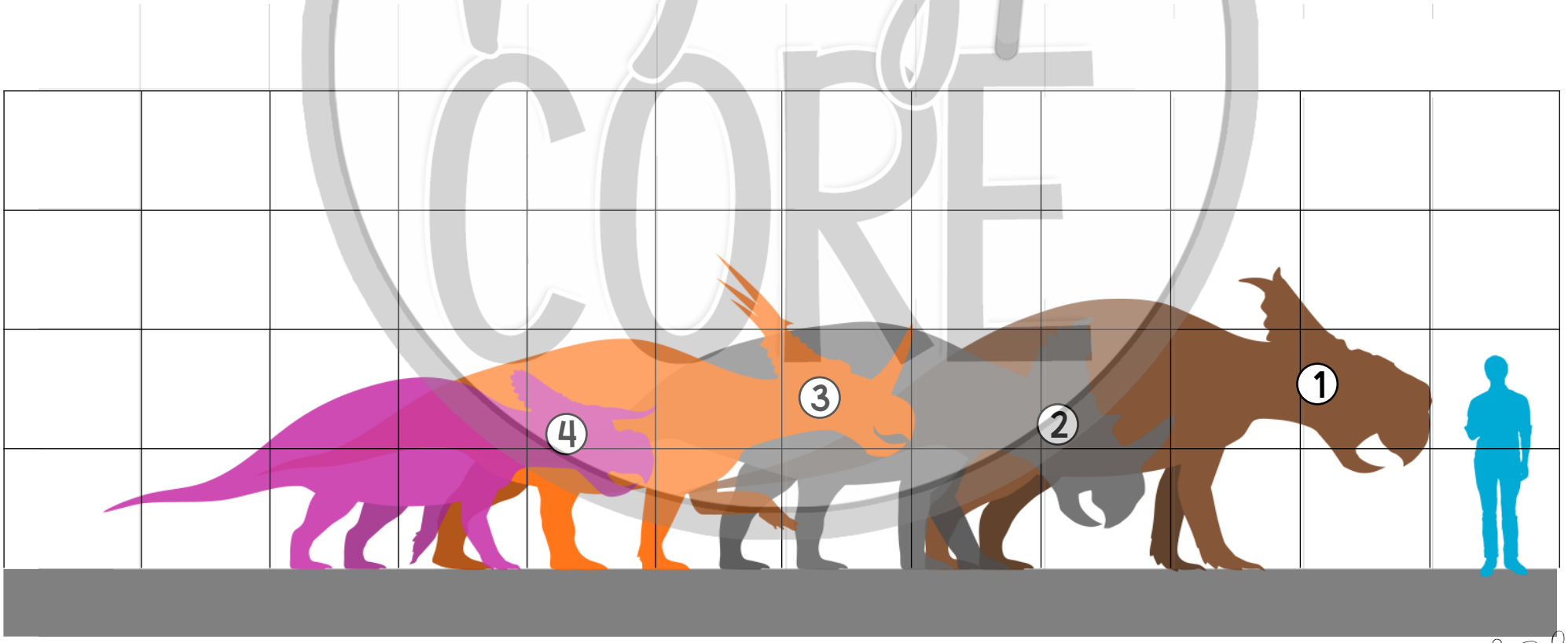
Dino Groups

Look at this diagram of dinosaur heights. If the man in the diagram is about six feet tall, about how tall is each of the dinosaur groups? Use the grid lines to help you decide. Be sure to ask yourself, "Is my answer reasonable?"

❶ Pachyrhinosaurus = _____ ❷ Centrosaurus = _____

❸ Styracosaurus = _____ ❹ Nasutoceratops = _____



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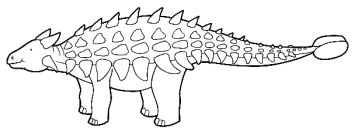
Dino Comparisons



Now it is time to compare your height to the height of each dinosaur. Write the height of each dinosaur listed in the chart below. Then find the difference (in feet) between your height and the height of each dinosaur.

Dinosaur	Height in feet	My height to the nearest foot	Difference in feet
Velociraptor	2		
Troodon	4		
Gallimimus	9		
Triceratops	10		
Stegosaurus	13		
Tyrannosaurus Rex	18		
Brachiosaurus	30		

What is the difference in height between you and the Triceratops?

What is the difference in height between you and Velociraptor?

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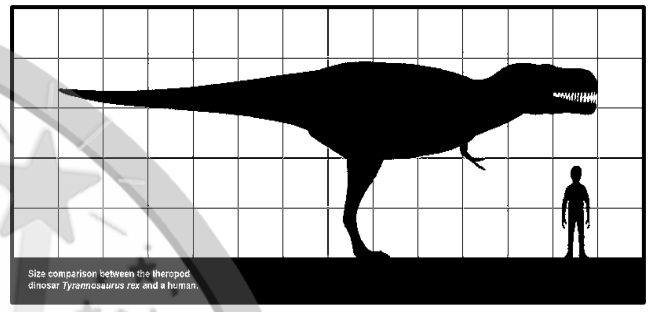
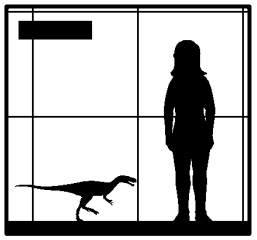
Dino Word Problems

A theropod is an animal that has three toes and walks on two legs. There were many different theropod dinosaurs. *T-Rex* was one of the largest theropods. It grew to 13 feet tall.

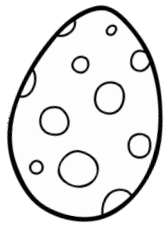




Not all theropods were huge. One theropod was called *Eodromaeus*. Like T-Rex, it walked on two legs. Unlike T-rex, it was very small. It was about 4 feet long and 1 foot tall.

1. What is the difference in height between the Tyrannosaurus Rex and the Eodromaeus? Write an equation that shows the math.

2. Are you taller or shorter than the Eodromaeus? Show with an equation.



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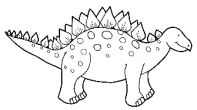
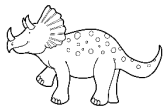
Dino Bar Graph

Complete the bar graph by coloring squares in each row that show the height of each dinosaur. In the last row, color in the correct number of squares to show your height to the nearest foot.

Dinosaur	Height in feet
Stegosaurus	13
Triceratops	10
Tyrannosaurus Rex	18
Velociraptor	2









Me

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Height in feet

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Challenge 1 ⟶ More Dino Word Problems



Imagine walking along the beach with your parents and finding a 220-million-year-old fossil of a dinosaur footprint. That is just what happened to 4-year-old Lily Wilder in January 2021. The footprint she found is only four inches long. It will be placed in the National Museum with Lily's name printed right next to it!

Scientists believe that for every inch a dinosaur track is from heel to toe, it is equal to 12 inches in height of that dinosaur. That means if a dinosaur was 12 inches tall, its footprint would have been about 1 inch long.

The dinosaur footprint that Lily Wilder found is 4 inches long. About how tall was the dinosaur? Draw a model that shows your thinking.

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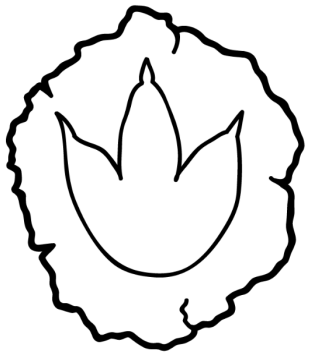
Challenge 2 ⟶ More Dino Word Problems

Theropod means "Beast Foot." These were meat-eating dinosaurs that walked on two feet with three toes and sharp claws. Scientists believe that one of the largest Theropod footprints ever found belongs to the T-Rex. It measures over 30 inches long.



1. Mark 30 inches on the floor using tape and a yardstick. Walk heel to toe a length of 30 inches. About how many of your feet would fit inside one T-Rex footprint?

2. Shaquille O'Neal played professional basketball. It is said that he had the largest feet of any basketball player. He wore a size 22 sneaker and his feet measured about 14 inches long. Can two of his feet fit into one T-Rex footprint heel to toe? Explain how you know.

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DINOSAUR MEASUREMENT

Self Reflection: Write a reflection of your experience with this project. How did you feel about the math problems and activities? What did you find easy? Did you find anything hard to do? Did you enjoy this activity? Why or why not?

Rate this project

Circle the statement you most agree with.

I am ready for something harder | It was just right | I found this very challenging

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Rubric

Self-Evaluation Rubric: Highlight or shade the parts of the rubric that express how you rate yourself on this Project Based Learning Activity.

+	✓	−
I felt very confident.	I felt good about most the the math.	I felt a lot of the math in was too hard for me.
I did not need help with the math problems.	I needed some help with some of the math problems.	I needed help to complete most of the math problems.
I used math strategies efficiently.	I needed some help using the best strategies.	I had trouble using strategies to solve many of the math problems.
I feel I am ready for a harder math project.	I feel I should practice similar math problems.	I feel I need help to work on similar math problems.

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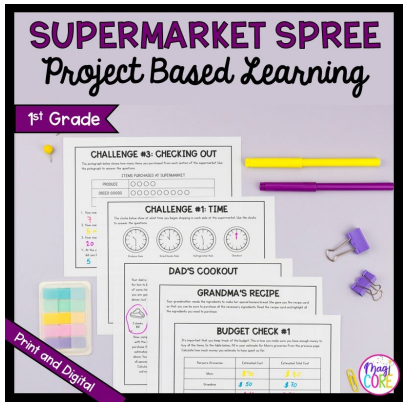

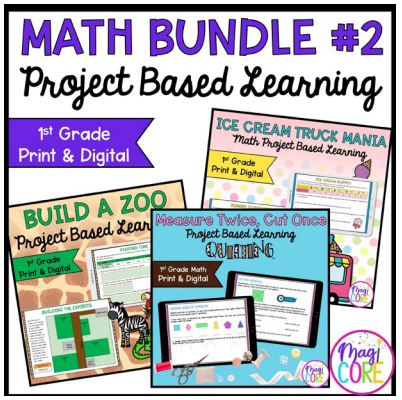

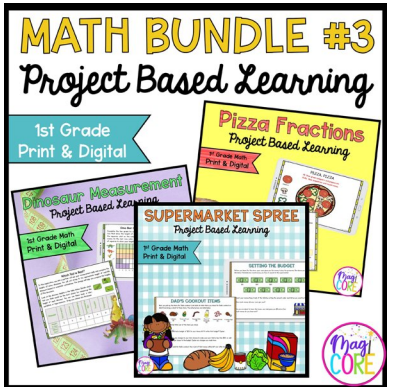

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