

PERFORMANCE TASK: Digging Dinosaurs

Approximately 1 day Adapted from the Noyce Foundation

STANDARDS FOR MATHEMATICAL CONTENT

MCC.1.OA.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.

MCC.1.OA.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.

MCC.1.OA.5. Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE

Provide opportunities for students to participate in shared problem-solving activities to solve word problems. Collaborate in small groups to develop problem-solving strategies using a variety of models such as drawings, words, and equations with symbols for the unknown numbers to find the solutions. Additionally, students need the opportunity to explain, write and reflect on their problem-solving strategies. The situations for the addition and subtraction story problems should involve sums and differences less than or equal to 20, using the numbers 0 to 20.

ESSENTIAL QUESTIONS

- How does decomposing a number help you in a problem solving situation?
- How do number sentences help you explain your thinking?
- How can we represent a number in a variety of ways?

MATERIALS

- Digging Dinosaurs Blackline Master
- Pencil and paper
- Digging Dino Water Template
- Ten Frame
- Counters

GROUPING

small group/partners/individual

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

Part I

Gather students in a common area. (Teacher holds up the picture) “Tell me about this picture? What do you see?” (Teacher solicits answers from students) “How many dinosaur feet do you see in this picture?” How many legs does a dinosaur have? Which dinosaurs have 2 legs? Which dinosaurs have 4 legs? Are there any other dinosaurs with a different number of legs? How many dinosaurs are standing in the lake? Explain why you think it would be that number. Can you draw a complete drawing of the dinosaurs standing in the lake? Can you show how you got your answer? (At the end of the investigation have students either discuss or dictate a response to the summary questions). (Teacher solicits answers from students and then states that the class will investigate this question) “We are going to try and figure out how many dinosaurs are standing in the lake.”

Using drawings, equations, and written responses, students work cooperatively or independently to solve.

How many dinosaurs are standing in the lake? Explain why you think it would be that number. Can you illustrate a complete drawing of the dinosaurs standing in the lake? Can you show how you got your answer?

(At the end of the investigation have students either discuss or dictate a response to the summary questions). (Teacher solicits answers from students and then states that the class will investigate this question) “We are going to try and figure out how many dinosaurs are standing in the lake.”

Part II

Students will create their own problem using the Digging Dino Water Template. They will then exchange their problems with a partner. Give students the opportunity to share with the class.

Part III

Students should play *Ten Frame Flash* in small groups for further practice with addition and subtraction. The first player shows a ten-frame for a count of three, then hides it while the other players place counters in the same positions on their frames from memory. The 'flasher' shows the card again and helps each player check his/her display. After three cards the next player becomes the 'flasher' and so on, until everyone has had a turn.

QUESTIONS FOR FORMATIVE STUDENT ASSESSMENT

- How many dinosaurs are standing in the lake?
- Explain why you think it would be that number.
- Can you draw a complete drawing of the dinosaurs standing in the lake?
- Can you show how you got your answer?

DIFFERENTIATION

Extension

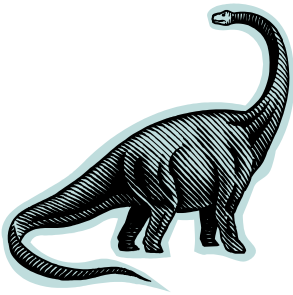
- Add additional dinosaur legs, have students describe what has changed and how their solution has changed.
- Find an additional solution, using different number combinations.

Intervention

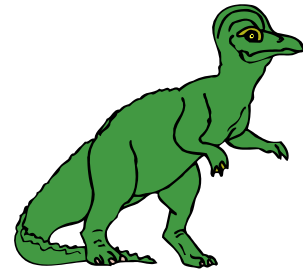
- Allow students to complete problem using manipulatives in a one-on-one interview-style setting.

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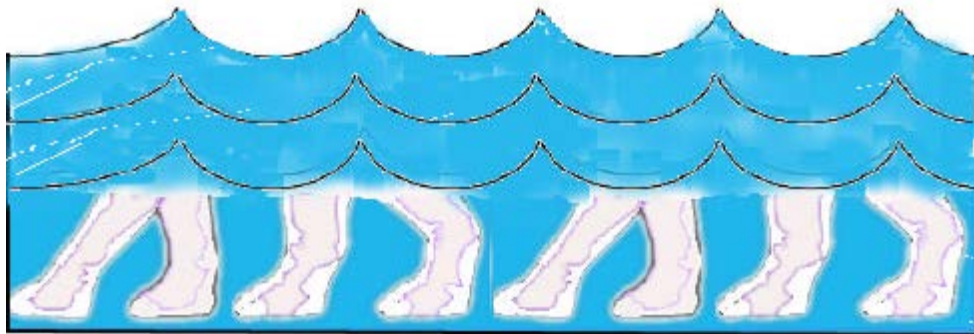
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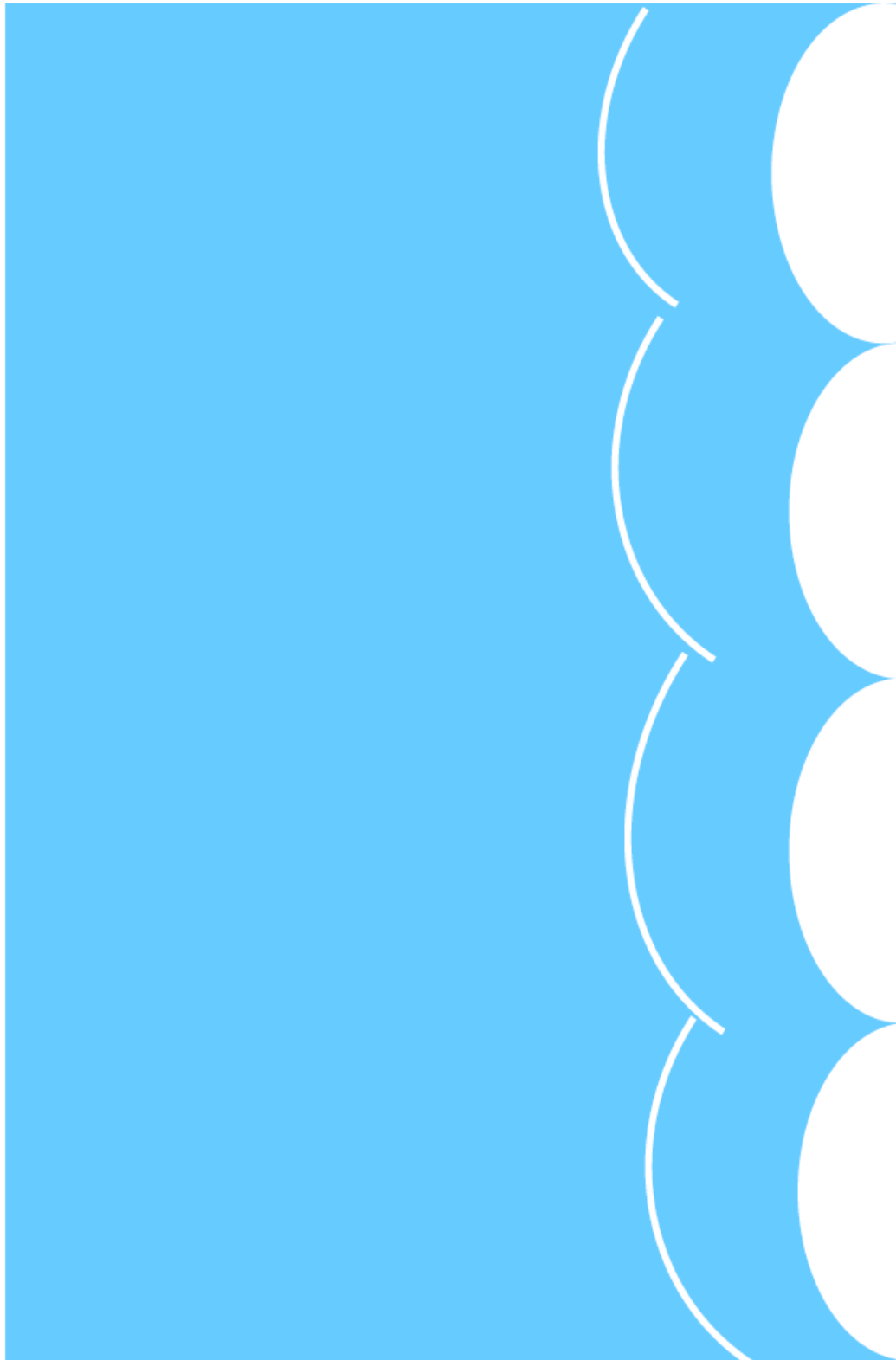
Digging Dinosaurs



You are swimming under water in a lake and you see dinosaur feet in the water. You don't want to go to the surface in case they are not friendly dinosaurs. Below is a picture of what you see.



How many dinosaurs are standing in the lake?
Explain how you know. Use words and mathematical language to explain your solution.



Ten Frame Flash

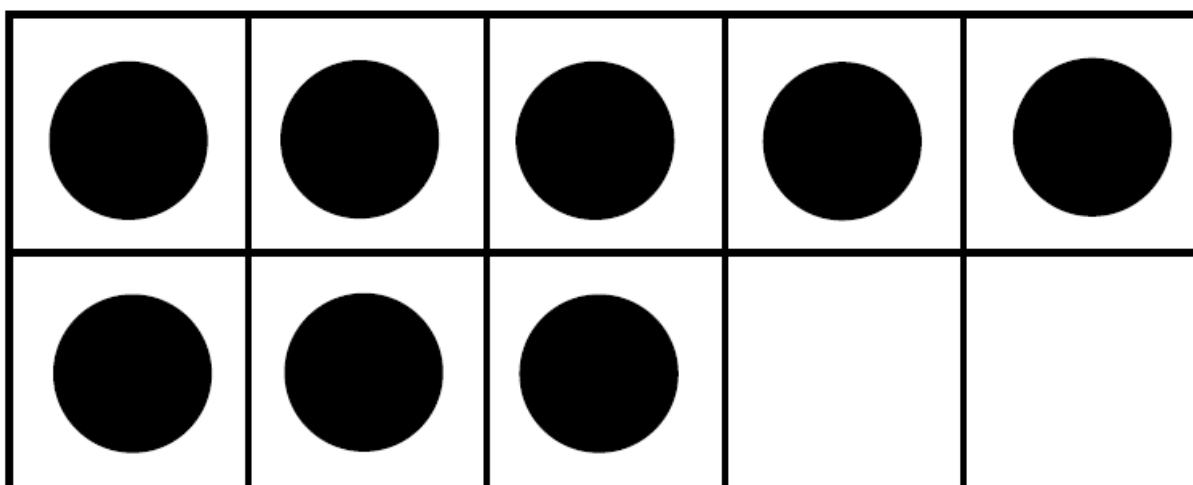
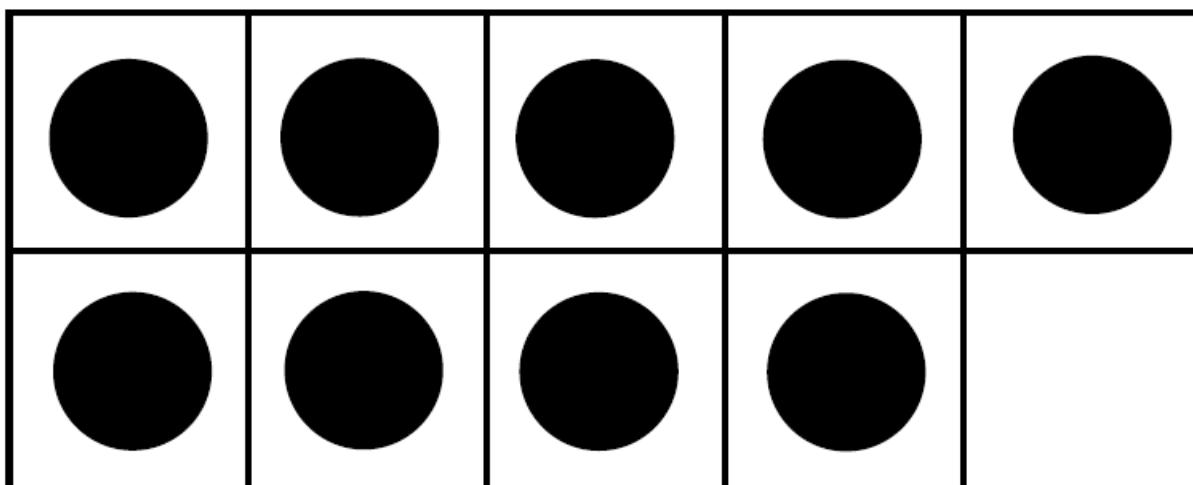
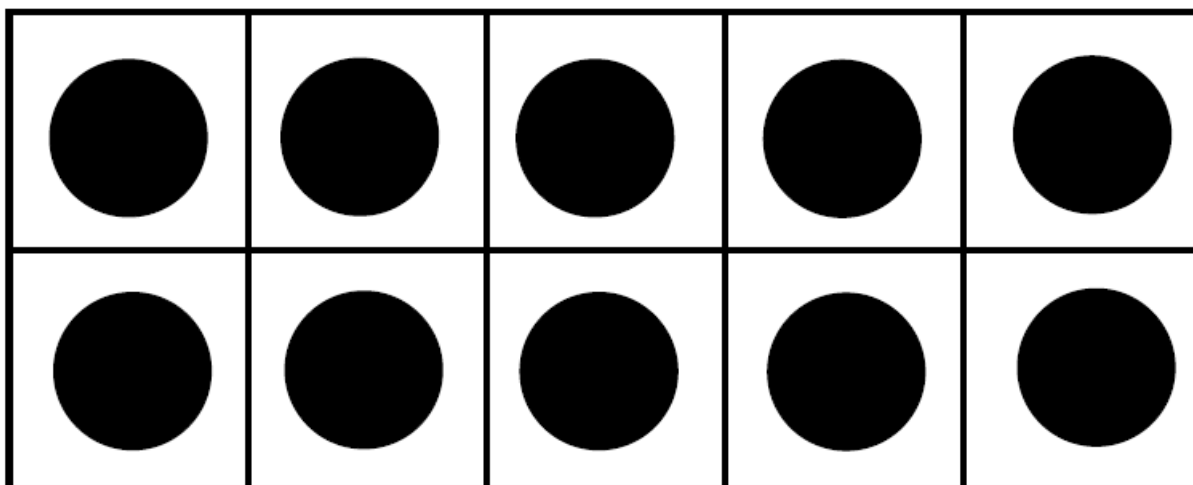
- Materials:** Ten-frames with dot arrangements
Counters
A blank ten-frame for each player
- Players:** four
- Rules:** The first player shows a ten-frame for a count of three, then hides it while the other players place counters in the same positions on their frames from memory. The 'flasher' shows the card again and helps each player check his/her display. After three cards the next player becomes the 'flasher' and so on, until everyone has had a turn.
- Variation 1:** Points can be awarded for each correct response. The player with the most points wins.
- Variation 2:** This game can be played as a whole class with one student using overhead versions of the filled ten frames to flash for the whole class.
- Variation 3:** A more difficult addition game can be played by flashing two ten frames at a time and having students show the sum of the two ten frames on one ten frame (or two if the sum is greater than 10).
- Variation 4:** A more difficult subtraction game can be played by flashing two ten frames at a time and having students show the difference on one ten frame.

This activity was adapted from:








<http://www.nrich.maths.org.uk/prime/may99/staff.htm>







Georgia Department of Education
Common Core Georgia Performance Standards Framework
First Grade Mathematics • Unit 5






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