

Teacher Instructions: Owl's Eyes

Grade Level: K - 2

Task: Owl's Eyes

Standard: Number Sense and Operations

It is night and the owls are watching in the trees.

If I see 12 eyes how many owls will I find and how many pairs of eyes do I see?

Teacher Note: There is a kindergarten version of the task included, but there are no benchmark descriptors or papers available for the task.

Context – From the Task Author: We had been doing an interdisciplinary unit on owls. This problem allows the student to investigate counting by two's and shows their understanding of pairs of objects and number sense. The student work samples were taken from a first grade class.

What the task accomplishes...

- This task provides a concrete example of counting by twos using pairs of eyes.
- The work will demonstrate the student's understanding of pairs and ability to apply concepts of counting by twos and use problem solving strategies.

What students will do...

- In solving this problem each student was provided with 12 gummed reinforcers. They colored them yellow to represent the eyes of owls.
- The directions also focused on the word trees being plural so they should have drawn more than one tree.

Time Required: Students can complete this task in 40 minutes

Interdisciplinary Links: This problem was integrated into a science theme about owls through the month of October. The children had the opportunity to investigate six different species of owls and observe a real Screech Owl. The students also compared and contrasted the habits of geese and owls in the fall. Pairs of wings and pairs of feet could also be incorporated into problem solving activities.

Teaching Tips...

- Students had many experiences during the week problem solving with pairs of children's eyes, pairs of hands, feet, shoes and Unifix cubes.
- Errors may be related to an inaccurate understanding of counting by twos and pairs of objects.
- This task also introduced the concept of even and odd numbers.
- Time was set aside to have the whole group share solutions and strategies.

Suggested Materials:

- Using real life examples (eyes, hands, ears, feet, shoes)
- Observing a real owl
- Posters or owl puppets (to place pennies or math manipulatives on the eyes)
- Read *Owl Babies* by Martin Waddell or other stories about owls.

Possible Solution...

There are six owls and six pairs of eyes.

Kindergarten Version:

There are five owls and five pairs of eyes.

Benchmark Descriptors:

- The benchmark descriptors and rubric are designed to help the teacher analyze student thinking and understanding at each of the four performance levels.
- The descriptors are generalizations of what student work could look like.
- It is not possible to anticipate every answer a student can give, so in scoring student work the teacher must use these generalizations to come to their own conclusions as to where a student is performing on the assessment.
- It is recommended that teachers create their own task specific rubric by listing the specific math skills that would make up each section of the four performance levels.

Novice

- ✓ Inappropriate procedures were used in labeling the pairs of eyes.
- ✓ The strategy of using numbers did not solve the problem.
- ✓ The explanation could not be understood.

Apprentice

- ✓ Used numbers as a strategy with a lot of labeling, but inaccurate solution and understanding of pairs.
- ✓ Some explanation was given.

Practitioner

- ✓ The solution shows a more clear understanding of the task.
- ✓ This solution does not show a lot of labeling, but the picture representation is very clear.
- ✓ The child took risks to write on her own and shows an accurate understanding of pairs of eyes and number of owls in the trees.

Expert

- ✓ The solution indicates an excellent understanding of the concept of pairs of eyes through the drawing and labeling with dictation from the child.
- ✓ There is an appropriate use of number strategies and more detailed explanation of the problem solving activity.

APS Mathematical Standards...

❖ **The math standards stated for this task are aligned to the APS Draft Standards 2000.**

Number Sense and Operations: Learners will demonstrate number sense through experiences with meaningful mathematical problems while focusing on number meaning, number relationships, relative effects of operations, and multiple representations to communicate sound mathematical thinking.

Kindergarten:

Number Meaning: Make connections of number names with quantities to 10.

Number Relationships: Compare groups and sets to understand the relationships of quantities.

- Combine and separate sets of objects with quantities to 10.

Number Operations: Model addition and subtraction situations

- Record numerical information

Fractions: Explore the relationships between half and whole.

- Explore halves and fractional parts through whole-part relationships.

First Grade:

Number Relationships: Increase the number of objects in groups and sets to understand the relationship of quantities.

- Build combinations of numbers to 20 in different ways using pictures, stories, and objects to model the combinations.
- Explore the concept of ordered pairs by linking commonly paired objects.

Operations: Model and record addition and subtraction in a variety of ways.

- Record strategies for solving, combining, and separating problems using pictures, numbers, equations and words.

Fractions: Explore the relationship between $\frac{1}{2}$ and whole, $\frac{1}{4}$ and whole.

- Explore fractional parts through part-whole relationships.

Second Grade:

Number Meaning: Extend and model number names with quantities to 100.

- Develop fluency and apply patterns in skip counting.
- Compare and defend the relationship between skip counting, grouping and multiplication.

Operations: Model, solve, and record solutions to addition and subtraction problems using a variety of strategies.

- Invent, present, defend, develop, and record multiple strategies to solve addition and subtraction problems.

Fractions: Explore simple unit fractions and other common fractions (e.g. $\frac{1}{2}$, $\frac{1}{3}$, $\frac{2}{4}$, $\frac{2}{3}$, $\frac{3}{4}$).

- Model and count equal fractional parts and determine how many parts make a whole.

Patterns, Functions, and Algebraic Concepts: Learners will demonstrate an understanding of algebraic concepts through experiences with meaningful mathematical problems while focusing on discovering, describing, modeling and generalizing patterns and functions, representing and analyzing relationships, and finding and supporting solutions.

Kindergarten:

Patterns: Demonstrate effective skills to establish an understanding of the predictability and reliability of recurring patterns.

- Identify, describe, and extend patterns with familiar objects in both classroom and real-life situations.

First Grade:

Patterns: Extend patterning skills that establish a sense of predictability and reliability to more complex patterns.

- Identify, describe, and extend patterns with familiar objects in real-life situations.
- Describe how a pattern develops, repeats, and builds toward more complex patterns.

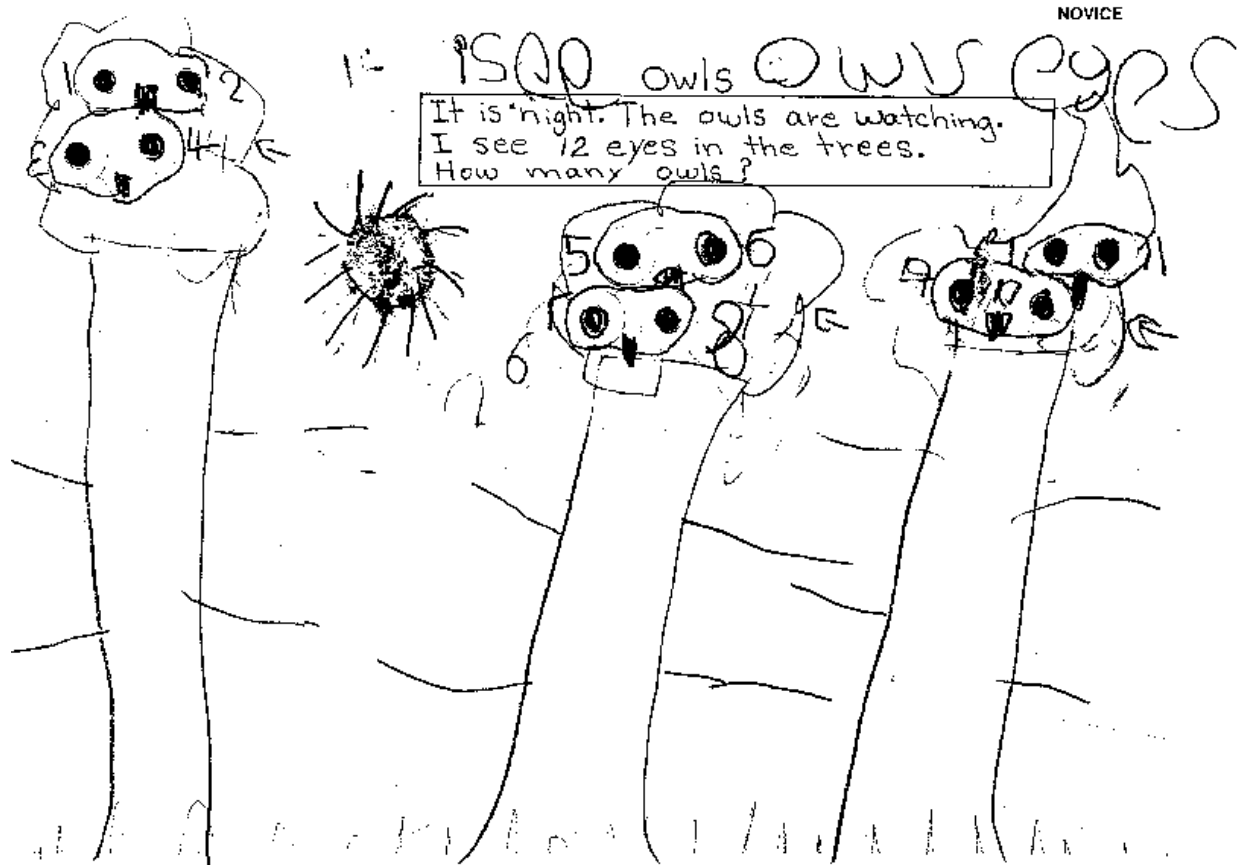
Second Grade:

Patterns: Extend patterning skills to include numerical patterns and problem solving, focusing on the predictability and reliability that patterns allow.

- Identify patterns in the number system.
- Recognize, describe, extend, and create a wide variety of patterns.

Benchmark Papers

Novice



Apprentice

Owls

APPRENTICE

It is night. The owls are watching.
I see 12 eyes in the trees.
How many owls?

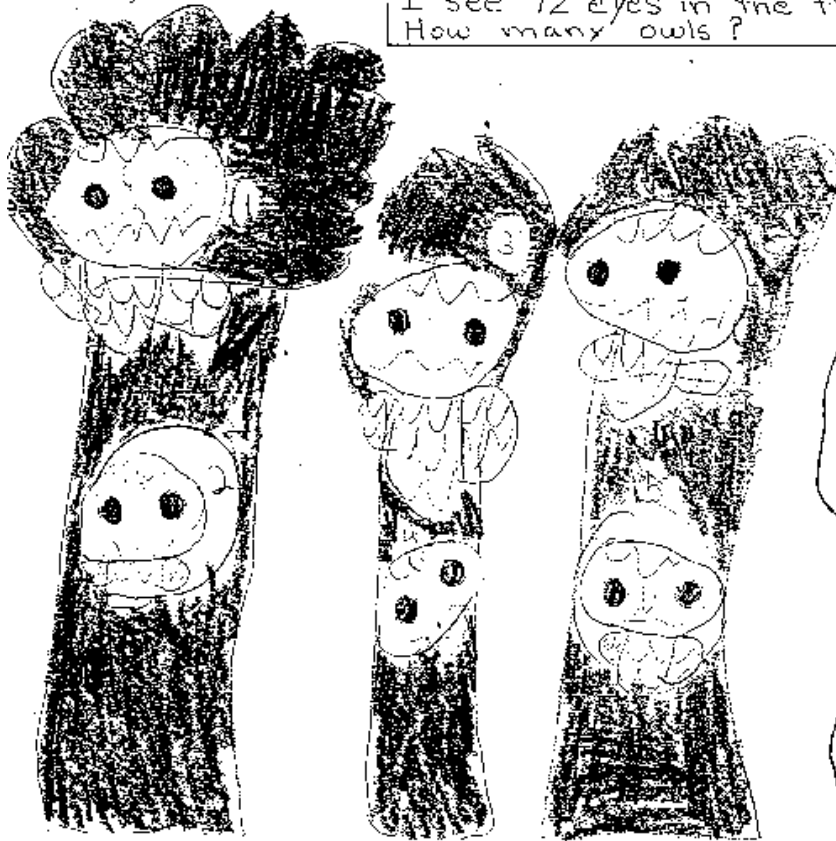
I see 6 OWLS in trees



Practitioner

Owls

It is night. The owls are watching.
I see 12 eyes in the trees.
How many owls?



PRACTITIONER

I SEE TWIN
EYES IN THE
TREE

SIX OWLS

6 PAIRS OF
EYES

Expert

Owls

It is night. The owls are watching.
I see 12 eyes in the trees.
How many owls?

EXPERT

