Whoo is Hunting?

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How many owls are in each family group if there are 64 talons in the habitat?

Grade Levels Pre-K-2

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Context

My class was studying owls. A great resource I use with this unit is the Outreach for Earth Stewardship, which I have used for several years because they do excellent school and public programs on wild birds, especially owls of Vermont. The children were able to have a close up experience of a Barred Owl to focus on the owl's attributes for math and science connections.

What This Task Accomplishes

This task enables the children to make a real-life connection that featured the feet of owls for an introduction to multiplication skills. They also needed to use whole number computation and to utilize an understanding of pairs. The representations were open ended for the quantity of each owl family.

What the Student Will Do

In solving this problem the students will need to use their observations of the owl's talons in order to begin the task. Some students will immediately begin representing the owl families with the appropriate groups of four talons for each foot, while others will use a variety of manipulatives to keep track of the talons and/or family members. When the task is complete, the representations should indicate the use of pairs, a variety of owl family groupings and correct use of four talons on each foot.

Time Required for the Task

60 minutes

Interdisciplinary Links

Children are always fascinated by owls, which is a way of integrating many math, science, literature and art connections. You can focus on the many attributes of owls to compare and contrast to other bird varieties (beaks, feet, habits, etc.). Sometimes I use owls in the fall to explore Native American folklore.

The Outreach for Earth Stewardship, as I mentioned before, is a great resource for classrooms and they are working on putting together classroom kits for teachers. I have also used the Vermont Institute for Natural Science in the past as a resource on birds of prey. Exploring Vermont authors was a major focus throughout the year and Jim Arnosky was a favorite for our Tree/Ecology theme. He recently published a beautiful new book called *All About Owls* which was a great resource. Nature sketching was also explored in the outdoor setting, to strengthen observation and visual/spatial skills, while using pen and ink for different drawing experiences. Another focus was learning about why the forest habitat was important to many species of owls and why the unique talons dictate the type of prey.

Teaching Tips

Students need real-life experiences to build an appreciation and understanding about the balance of nature for any living creature. Activities like these enable them to make better connections in reasoning, communicating and seeing the relationships when they combine math skills, scientific exploration and writing. The students will be more confident attempting this task if they have had many opportunities grouping objects and computing patterns of numbers in a variety of ways. They also need concrete experiences in using pairs of items.

Suggested Materials

- Use Outreach For Earth Stewardship, Vermont Institute for Natural Science or other local resources as a real-life resource for owls or other birds of prey. If cost is a factor, collect posters or calendar pictures of owls that clearly illustrate the attributes of talons, beaks, eyes, size and habitats.
- Science videos are a great resource if available.
- Manipulatives such as color tiles, Unifix cubes, centimeter cubes and others may be used to represent talons and/or families of owls.

Possible Solutions

This was a very interesting problem as many of the students discovered an error in the total of talons! The original number of talons to work with was 60 and I was pleased to have many students discover that this did not work for a logical solution for the owls. They told me that it needed to be changed to 64 to make sense, which was the correct number we used for the final solution. Each family group should have had at least a pair of owls if the students remembered that they mate for life. The size of the family is open ended depending on their reasoning behind the groupings. When 64 talons are used accurately, each student should represent eight owls.

Benchmark Descriptors

Novice

A Novice response demonstrates a limited understanding of the task. Students may just draw lots of owls with their talons, but have no strategy in organizing families or computing owls with

their talons to equal 64. A Novice does not understand the concept of equal pairs of feet, the realistic size of owl families and is unable to demonstrate a solution.

Apprentice
An Apprentice solution demonstrates some understanding of the problem. An Apprentice may understand the concept of adult pairs, families with owlets and may use some appropriate mathematical representation for the talons. An Apprentice may not have a complete strategy to accurately compute the number of talons per owl in every grouping, which may lead to an incorrect solution.

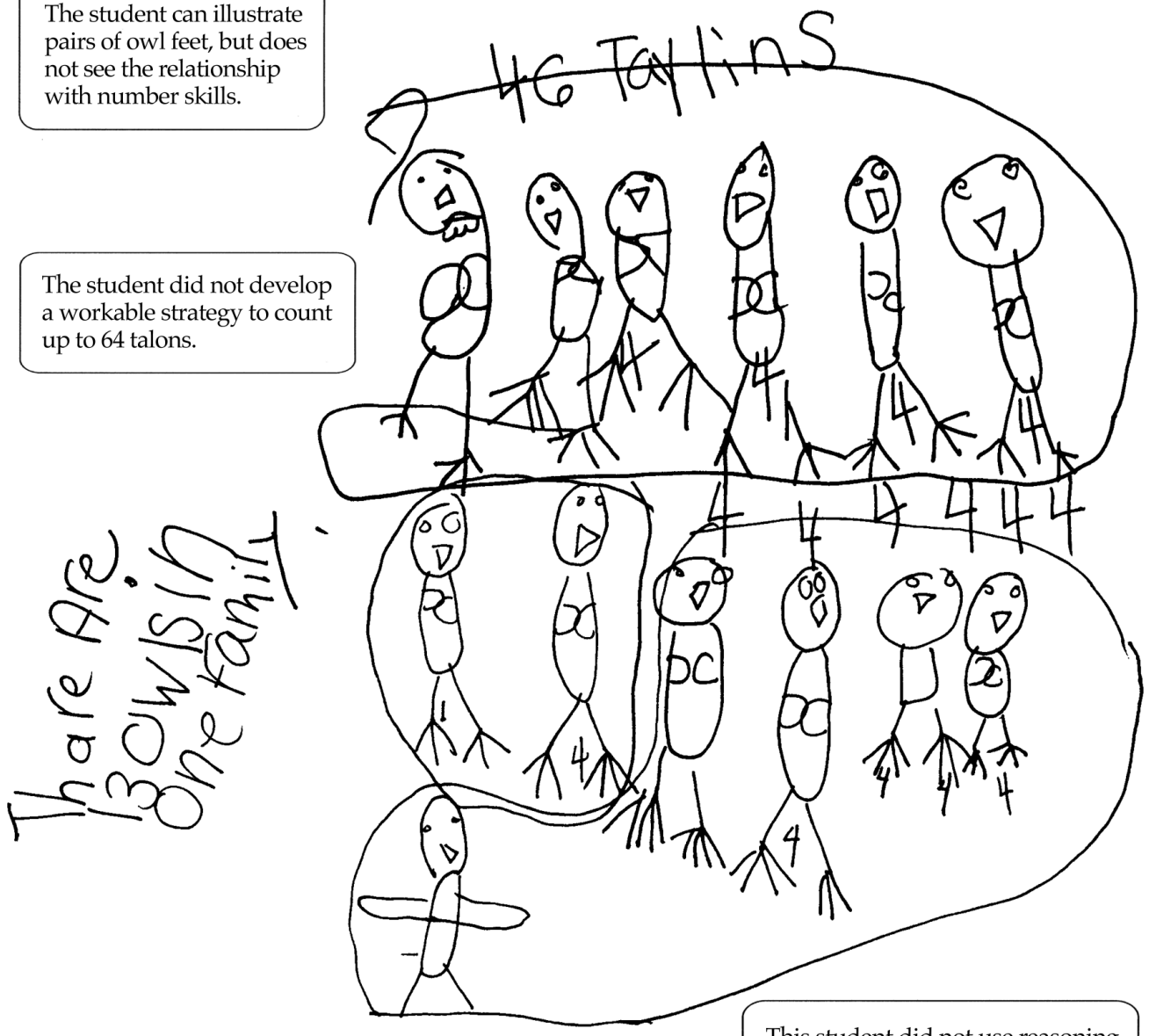
Practitioner
A Practitioner's solution demonstrates a clear understanding of the problem and uses effective strategies to arrive at a solution. A Practitioner utilizes pairs, owlets and mathematical representation to compute the correct number of talons for each family of owls that results in a total of eight.

Expert
An Expert's solution demonstrates a deep understanding of the problem and demonstrates the ability to compute accurately by fours to solve the task with higher level thinking skills. An Expert uses effective communication to explain the families of owls and uses 64 talons to total eight owls for a logical solution.

Novice

The student can illustrate pairs of owl feet, but does not see the relationship with number skills.

The student did not develop a workable strategy to count up to 64 talons.

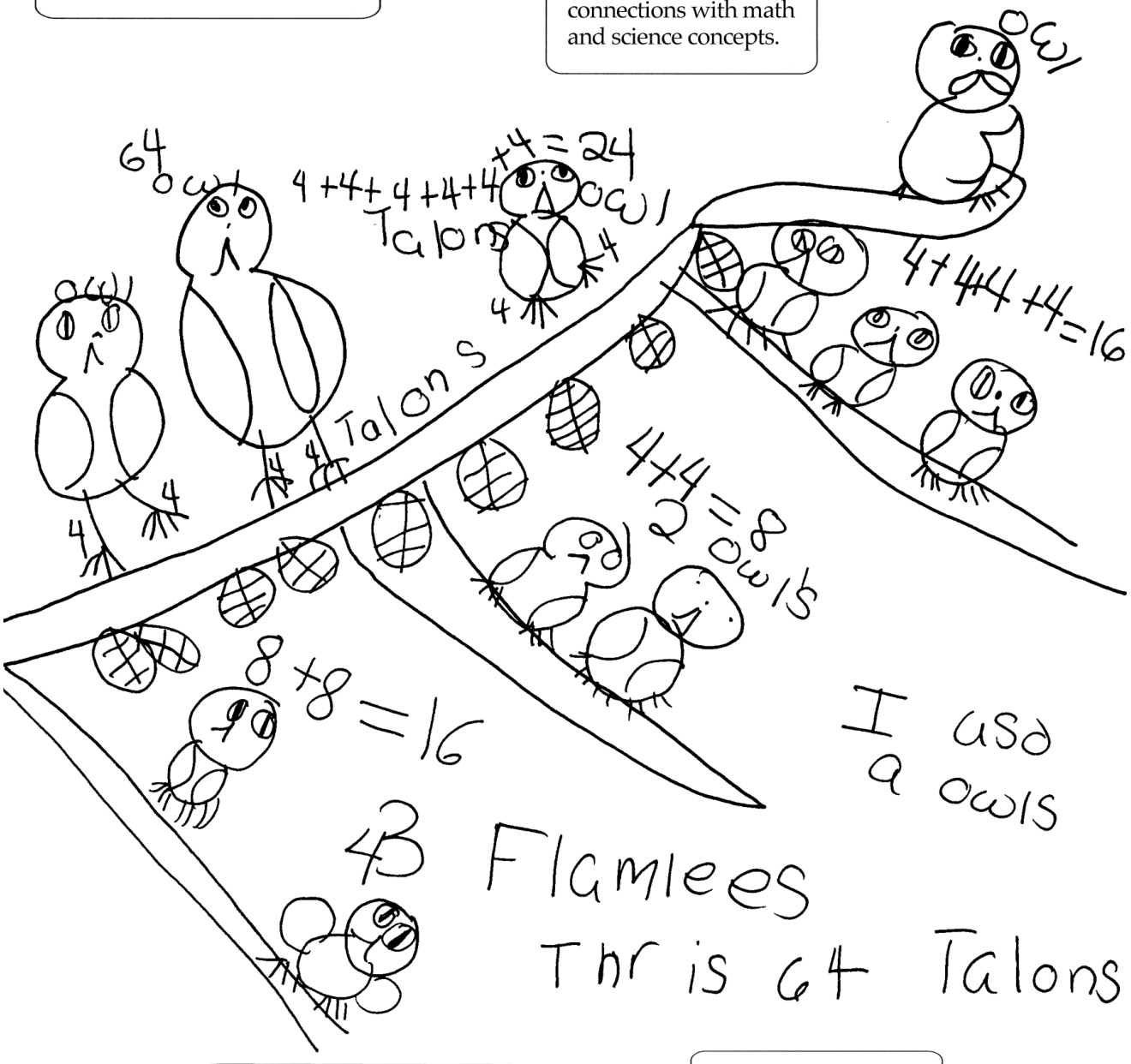


This student did not use reasoning skills for family size or make connections with information presented on owls.

Apprentice

This student did begin a useful strategy to compute the talons and group owl families.

This student can make connections with math and science concepts.

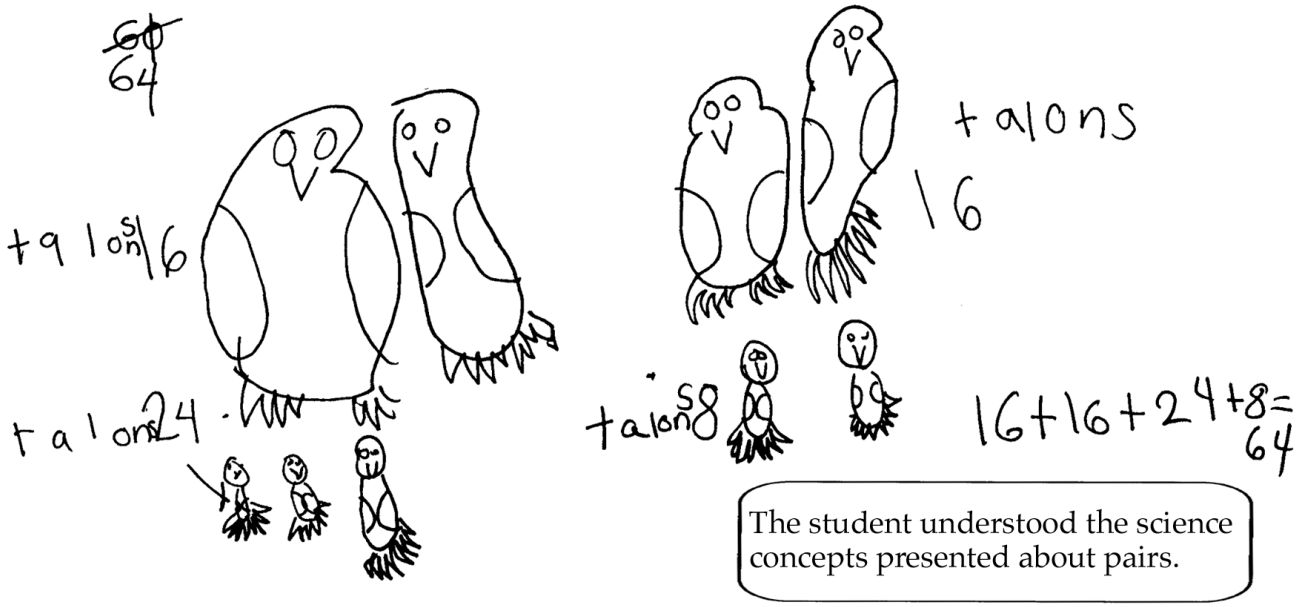


This student needs to check strategies and computation for consistent accuracy.

This student used too many owls.

Practitioner

The student used a strategy effectively for the talons.



The student understood the science concepts presented about pairs.

The owl family has three owlets And another family has one owlets And

This student has strong computational skill and understanding of number sense.

Expert

This student has a deep understanding of numbers (counting by four's easily).

This student was able to quickly see that 60 talons would not work in the beginning.

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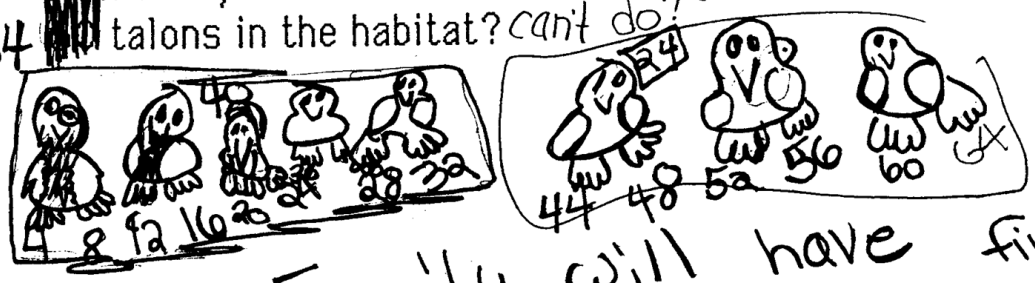

One Family will have five owls and fourty talons. A nether family will have three owls and 24 talons. So if one family has 40 talons and a nethe has 24 talons 40+24 = 64.

This student uses math, science, and writing to provide a clear explanation for the solution of eight owls.