

Teacher Instructions: Finicky Cat

Grade Level: K - 2

Task: Finicky Cat

Standard: Patterns, Functions, and Algebraic Concepts

My cat is very finicky, as most cats are. She will only eat the following foods:

<u>A</u>		<u>B</u>
Shrimp		
Or		Rice
Tuna	WITH	Or
Or		Potatoes
Roast Beef		

If each day, she has one item from column A, with one item from column B, how many days in a row can my cat have a different meal?

Context – From the Task Author: This task was used as a "filler" or "sponge" activity when our usual schedule was changed because of a special end-of-the-year event. But, this is a good task to give when doing a unit on combinations.

What the task accomplishes...

- This task readily engages the interest of the students because of their familiarity with cats as pets, and their appreciation of a cat's or their own finicky ways!
- The task involves finding different combinations, following rules, reading and understanding a chart, and gives students the opportunity to work systematically.

What students will do...

- Some students will randomly write down different combinations. Others will systematically list the possibilities using the structure of column A and B. Some students will write the food combinations they find in full. Others will employ a symbolic system to represent each food.

Time Required: The task will take students 20 to 30 minutes to complete.

Interdisciplinary Links: This task could readily be related to a study or discussion of pets, or cats in particular. It could also be related to a study of food groups. There are many excellent picture storybooks featuring cats, such as Eleanor Clymer's *Horatio* books or Mary Calhoun's cat series.

During the year our class builds a list of what we call 'sparkle' words to use in their writing. These are words that are more exciting than the more usual words that might be used. 'Finicky' would certainly qualify as a 'sparkle' word, and a discussion of its meaning and use would be a good lead into the problem.

Teaching Tips...

- It is important to make sure the students know what 'finicky' means, and that they understand the column A, column B formats.
- My students are familiar with columns and rows from their use in the many charts with which they had experienced. Younger students might be helped with a more concrete image. For example, it could be explained that the shrimp, tuna, and roast

beef are kept on one shelf, box, or basket, and the rice and potatoes on another shelf, box, or basket.

- I reminded the students before they got to work that a good solution would list the different combinations they found as well as telling how many different combinations were possible, as well as the last day in which the combinations will not be repeated.
- For those who finished early, I suggested they draw a picture of the finicky cat with the combination they thought the cat might prefer.

Suggested Materials: Paper and pencil to work on the problem. Some students may need pictures of the foods to manipulate. Bringing in a can of cat food that is a combination variety may be an interesting way to spark discussion and interest in the problem, as well as provide a real life context for combinations.

Possible Solution...

- ✓ There is one solution. The foods can be combined to provide different meals for the cat for 6 days in a row. However, there are 2 different systematic, as opposed to random, lists the students may produce:
 - Shrimp and rice
 - Tuna and rice
 - Roast beef and rice
 - Shrimp and potatoes
 - Tuna and potatoes
 - Roast beef and potatoes
- Shrimp and rice
- Shrimp and potatoes
- Tuna and rice
- Tuna and potatoes
- Roast beef and rice
- Roast beef and potatoes

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

- ✓ The novice students either have a problem following the rules of the task and combine foods from the same column; or do not fully understand the concept of mixing and matching to make different combinations.
- ✓ When they have used the foods in one column once, they stop, and think they have solved the problem.

Apprentice

- ✓ The apprentice understands how to make different combinations using the rules, but does not arrive at the correct solution either because s/he does not find all the possible solutions, or fails to notice that s/he has repeated a combination.

Practitioner

- ✓ The practitioner understands how to make different combinations using the rules, and by trial and error or systematically finds all the possible combinations, and is careful not to repeat any combinations.

Expert

- ✓ The expert not only understands how to make different combinations using the rules, but also goes about the task systematically, listing foods from the columns in an orderly way.
- ✓ The expert also uses symbols to represent the foods in an efficient manner.
- ✓ In one case, the expert knows without listing them, that the number of possible combination will be the product of the number of items in each column.
- ✓ Expert solutions will also include mathematically relevant observations such as stating a rule for solving the problem, or make a comment on what day of the week the cat will have its first repeated meal.

APS Mathematical Standards...

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

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.

Second Grade:

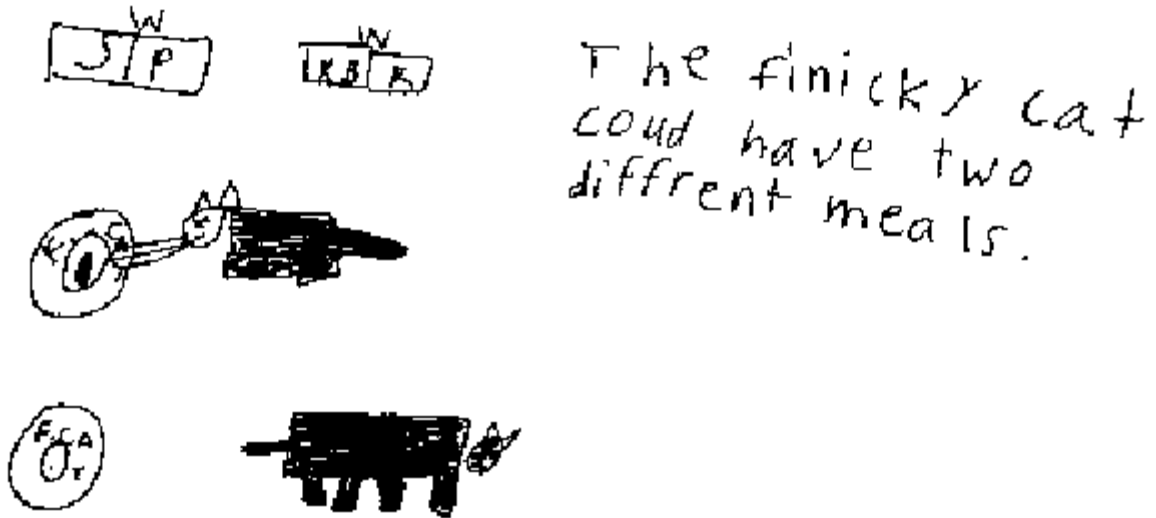
Patterns: Extend patterning skills to include numerical patterns and problem solving, focusing on the predictability and reliability that patterns allow.

- **Develop and apply** more complex patterns and relationships in real-life and math problem situations.
- **Recognize, describe, extend, and create** a wide variety of patterns.

Benchmark Papers

Novice

No math language
is used.



The student is only able to
come up with two solutions
and doesn't show
understanding of being able
to use items from column B
more than once.

Apprentice

Little or no math language is used.

Shrimp and Rice
tuna and Potatoes
Roast Beef and Potatoes

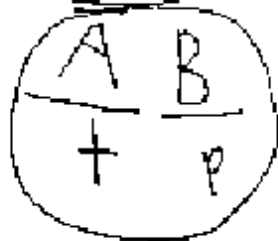
my cat can have 3 meals.

The student is able to find some of the combinations.

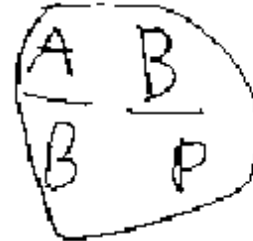
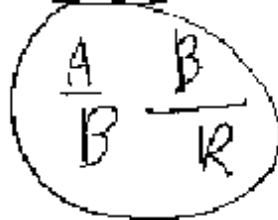
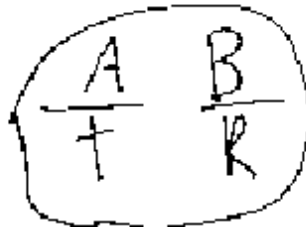
The student shows her / his solution.

Practitioner

All combinations
are found.



Work is organized.



my cat can have
6 meals.

Answer is high lighted.

Expert

Work is organized and labeled.

$2 \times 3 = 6$

The cat can have 6 different meals

The student uses accurate math language.

The student explicates her/his solution.

The student shows the problem two different ways which could be used to verify the solution.