


Original Curriculum

CT Focus: Pattern Recognition	 https://goo.gl/123pNF
Cross-Curricular Ties: Science	
Age Range: 8–16	
Duration: 30 minutes	
Scan the QR Code or type the URL to see a video example of how patterns can provide extra information.	

Overview

This lesson takes a deep look at patterns found in nature and challenges students to figure out which items are related to each other based on the patterns that they’ve found. Some items will be from the same family; others will have the same function. It’s up to your students to figure out what the patterns are telling them!

Vocabulary

Pattern matching: Finding a theme that is repeated in more than one place.

Lesson Objectives	Materials and Resources
Students will be able to: <ul style="list-style-type: none">• Compare items to find similarities• Infer information about items based on similarities• Explain why they believe two items are related, based on patterns that they found	<ul style="list-style-type: none">• Paper• Pencils• Whiteboard or projector• Divine items to match

Preparation

1. Read the lesson and decide how it can best fit into the age range of students in your classroom.
2. Watch the video at <https://goo.gl/123pNF> in preparation of showing it to your class.
3. Gather pictures of “Divine Items.” These will include a variety of images of things that have something in common. For example, find three or four images from three or four of the following groups:

..... Lesson Plan: Divine Patterns

- a. Animals mentioned in the video, with clear view of their slit pupils
 - b. Carnivores with sharp teeth showing
 - c. Animals with wings
 - d. Foods with seeds showing (fruits)
 - e. Green veggies
 - f. Fish that glow (deep sea fish)
4. If students will be working in groups (Grades 3 and higher), print out enough "Divine Items" for each group. If the whole class is working together, you can cut items into individual cards for use with overhead projection.
 5. Decide if you want to include the bits of "extra information" (e.g., "Carnivores") with the Divine Items. This is recommended with younger students. An alternative would be to have information sheets around the rooms that give clues about determining traits based on the patterns that you chose.

Activity

Step 1. Introduction—Show your class the video linked in step 2 of the Preparation list, and then ask:

- What feature did the animals in the video have in common? (Slit eyes)
- What behavior did the video tell us that all of those animals share? (They all hunt at night and are low to the ground.)
- If we found another animal that fit into that pattern (had slit eyes), what might we be able to conclude about it? (That it hunts at night and is low to the ground)

There are patterns all around us, and often, those patterns tell us things. Sometimes, we can determine extra information about one thing just because we recognize that it fits into a pattern with other things.

Step 2. Play with patterns—Have students group images appropriately to begin looking for patterns in the Divine Items. Challenge them to see how many groupings they can come up with within 10 minutes. Have them write down both the patterns that they spotted and what they think it means so that they don't forget their thought process when it's time to share.

Keep in mind: Even though you started the exercise with items that go together in a certain way, never underestimate a group's ability to find new and valid patterns! The fact that they might come up with something other than what you planned doesn't mean that they're wrong!

..... Lesson Plan: Divine Patterns

Step 3. Share—After 10 minutes, ask students how many groupings they were able to make. Who thinks they came up with something that no one else found? Let each group share with the others at least two patterns and the corresponding information that the pattern related.

Step 4. Discuss together—Time to wrap up with a chat:

- What were the most interesting patterns that you found?
- Did you find any patterns that didn't seem to tell you anything?
- What was the largest grouping of patterns that you found? What did it tell you?
- Can you think of any other images that you wish had been included so that you could share your knowledge of what their patterns mean?

Step 5. In the real world—Computer scientists use pattern matching every day! To make computer programs as strong as they can be, programmers look for patterns in their problems and try to solve them based on solutions that they've used for other problems that were similar.

Some computer scientists called *data scientists* spend their days looking for patterns in information so that they can spot trends and failures in products and ideas.

Pattern matching is a key piece of problem solving. When you have a problem that seems really hard, you can often break it up into little pieces and look for patterns. These patterns just might point to a solution that will work for your bigger issue!

Solutions for first three sets (basic patterns)

1. Add 4 to the last number: 25
2. Add another level to the pyramid: 5 levels
3. Add another side to the polygon: an octagon

Solutions for second three sets (complex patterns)

4. Next decimal digit of pi: 5
5. Next binary representation (moving clockwise): both the top and right bubbles filled in.
6. Odds +4, Evens +1: a heptagon