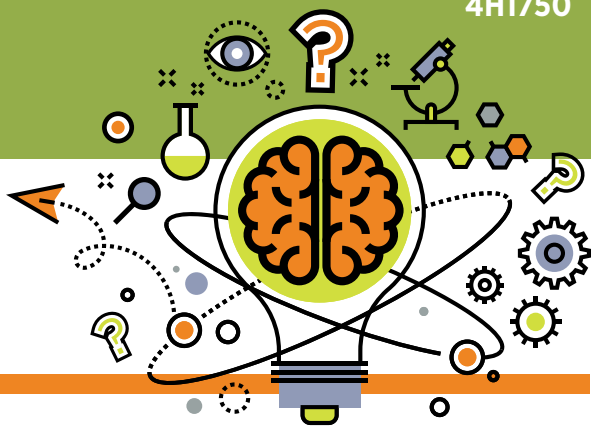
TEACHING SCIENCE
...when you don't know diddly-squat



Why do zebras have stripes?

Purpose:

The purpose is **not** to teach specific content, but to teach the process of science – asking questions and discovering answers. This activity encourages young people to try to figure things out for themselves rather than just read an answer on the internet or in a book. As a leader, try not to express your opinion, but let the youth engage in arguments based on evidence.

Time required:

20 minutes or multiple days depending on the interest and questions the youth have

Materials:

- ❏ Ladder or high place
- ❏ Paper
- ❏ Markers or Crayons
- ❏ Scissors

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Preparation:

Cut plain white pieces of paper into roughly dollar-bill-sized pieces. Do the same with paper that you have covered with black and white zebra striping on both sides.

SCIENCE PRACTICE:
Asking questions and defining problems

1. *Why do zebras have stripes? Is it for hiding? If that is the case, why are the zebras black and white instead of brown or green like vegetation? In large groups like zebras are usually in, does hiding really work?* One potential thought is the bold stripes aren't for hiding, but to distract and confuse predators. *Is there a way to test that?*

SCIENCE PRACTICE:
Planning and carrying out investigations

2. Drop the plain white papers from a ladder or tall place and ask the youth to catch as many pieces as they can before they hit the ground. Repeat with the zebra-striped paper. Run several trials with both to see if there is consistency.

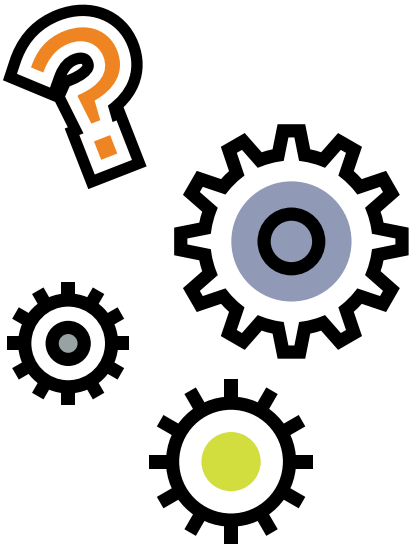
SCIENCE PRACTICE:
Using mathematics and computational thinking

3. Create a chart like the one below:

Striped vs. Unstriped Paper Caught

Trials	Number of white papers caught	Number of zebra-striped papers caught

You do not need all the answers to teach science. You simply need an inquisitive mind and to be willing to carry out an investigation.



SCIENCE PRACTICE:
Analyzing and interpreting data

4. *Were more white papers or more zebra-striped papers caught? Was there consistency across several trials?*

SCIENCE PRACTICE:
Constructing explanations and designing solutions

5. *Was it more difficult to grab the zebra-striped paper? Why or why not? Were there any complications in the experiment? Is there anything you could do to make it better?*

SCIENCE PRACTICE:
Engaging in argument from evidence

6. *Do you think there is any distraction effect from black and white striping? Why or why not? Do you think it would matter where you do this experiment? What if it was conducted inside a room compared to a more natural environment?*

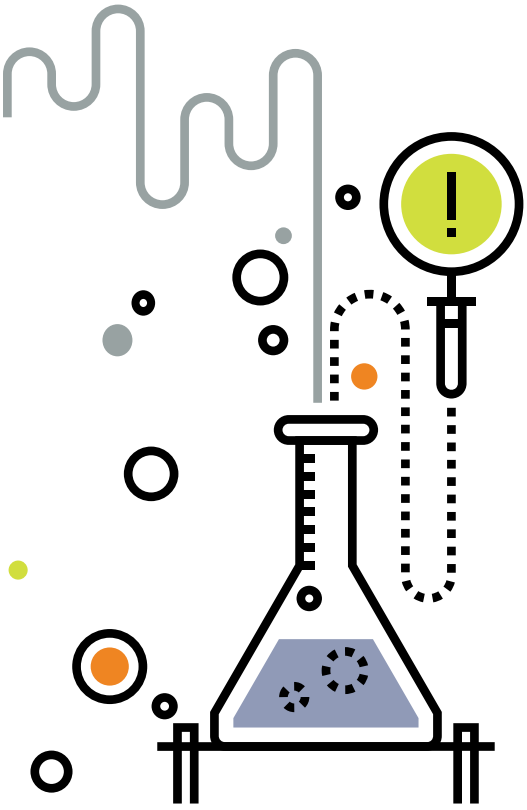
SCIENCE PRACTICE:
Obtaining, evaluating, and communicating information

7. *Do you think the results of your trial could be applied to any careers? Could it be helpful for hunters? Or the military? Why or why not? Do you have other thoughts about why zebras have stripes?*

Other thoughts:

- *Does the thickness of the striping matter? How could you test this?*
- *Does the striping pattern matter? What if they are horizontal vs. vertical vs. diagonal striping?*
- *Do you think the stripes could confuse flies?*
- *Do you think the stripes help zebras regulate their body temperature?*
- *Do you think the pattern of stripes help zebras identify each other?*

If you would like to explore more about why zebras have stripes, check out this article from BBC Future "The Truth Behind Why Zebras Have Stripes": https://www.bbc.com/future/article/20191031-the-truth-behind-why-zebras-have-stripes



Science & Engineering Practices:

These eight Science and Engineering Practices come from *A Framework for K–12 Science Education* (National Research Council, 2012, p. 42). These research-based best practices for engaging youth in science are connected to in-school science standards that all children must meet.

- Asking questions and defining problems
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics and computational thinking
- Constructing explanations and designing solutions
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information

Reference:

National Research Council. (2012). *A framework for K-12 science education: Practices, crosscutting concepts, and core ideas*. National Academies Press.