

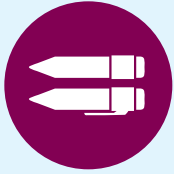
ADVANCED LEARNING LABS

A partnership between the North Carolina Department of Public Instruction and Duke TIP
TO ENGAGE, ACTIVATE, AND GROW OUR STUDENTS

GRADES

4-5

Lab 2 • Exploration



ELA

An “Origin Story” is a fictional narrative that explains why something is the way it is (why a tiger has stripes or why a snake has no legs, for example). Origin stories often come in the form of fables or fairy tales. They can even be about characters that have superpowers and describe how a person became a superhero, like Spider-Man or Superman.

Explore your imagination to create a story about why something is the way it is. It could be something in nature or a superhero. Write a fable, fairy tale, or comic strip detailing your origin story.



SOCIAL STUDIES

Draw a map of North Carolina and label the three regions of the state. Add illustrations within each region showing what makes it distinct from the other two.

Beneath your map write a short story about a person who lives in one region but must travel to the other two. You could also write a diary entry from this person’s perspective.

Be sure to include the geographic distinctions you illustrated and how geography impacted the story or diary entry.



SCIENCE

Explore Magnetism!

How does magnetic force pass through materials that are not magnetic?

Find a paper plate (or something of similar thickness), a paperclip, and a magnet. With the paperclip on one side of the plate and the magnet on the other, try moving the paperclip with the magnet.

How many paper plates can you stack and the magnet will still work? Can you feel the magnetic force in the air? What if you removed the paper plate? Test the magnetism with materials of different types and thicknesses? Share your results with a friend or family member.



MINDFULNESS

A “mandala” is a circular structure with radial symmetry. It can also be a tool for focusing attention and expressing creativity. Today:

1. Gather coloring supplies (markers, pens, crayons).
2. Print a mandala (or trace it onto blank paper).
3. Find a quiet and comfortable spot to color without distractions.
4. Start coloring!

While coloring, try not to think too much about color choice or anything else. Make this time about you; maybe listen to a favorite song. Allow yourself to simply enjoy this time.

Link: <https://www.free-mandalas.net/>



LOGIC PUZZLE

Monopoly

Help this group of friends put their gameboard back together after some of their pieces were knocked off!

Use the grid puzzle and the clues you are given to figure out with which pawn each friend is playing and which contract they own.

Link: <https://bit.ly/2xg84r4>



FIELD STUDIES

Join NASA Commander Suni Williams to tour her office: the International Space Station! Start with the "Harmony, Tranquility, Unity" tour.

Observe the hygiene and sleeping stations, laboratories, different modules, and command central. Connect life on the International Space Station with your life at home by considering how things are similar and what challenges are presented in space.

Write a detailed description, draw a blueprint of, or create a model of your own space station. Explain why you added each feature and the purpose it will serve during your time in space.

Link: https://www.nasa.gov/mission_pages/station/main/suni_iss_tour.html



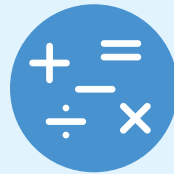
RESEARCH EXPLORATIONS

Engineers experiment with different materials to find what works best in a situation. Visit the link below to learn more about paper hovercrafts. Find four different materials such as paper, cardboard, aluminum foil, and newspaper to create a hovercraft.

First, predict which will travel the farthest. Then make a hovercraft out of each material. Test them to see which hovercraft vehicle travels farthest.

Experiment to see if you can combine different materials to create one that travels even farther. Which parts of the hovercraft are better with lighter materials and which parts with heavier materials? Why do you think that is?

Link: <http://www.sciencefun.org/kidszone/experiments/paper-hovercrafts/>



MATH

Colony	Max. Size	Minutes to observe 1st lemur	Minutes per additional lemur
Collared (CL)	10	6	4
Ring-tailed (RT)	24	4	2

You observe lemur colonies; observation times vary by the number of lemurs present. Graph each colony's observation times. How many lemurs would you observe in 35 minutes? How long would you need to observe all lemurs? Describe the relationship between CL and RT observations.



North Carolina Department of
PUBLIC INSTRUCTION



DUKE UNIVERSITY
TALENT IDENTIFICATION PROGRAM

Lab 2 • Exploration

Works Cited and Answers

Answers

Math K-1 Solution:

Scores will vary. When discussing if it is easier or harder to pull doubles with 1-5 or 1-10, you can talk with your student about the chance of getting doubles - higher with only 5 numbers in each container - and the higher scores - you could score 20 if you pull 2 10s or 10 if you pull two 5s. You also have a greater chance in each game of having to subtract compared to when you add, with larger integers in the second round. In each game, you will likely see different interactions between probability and score.

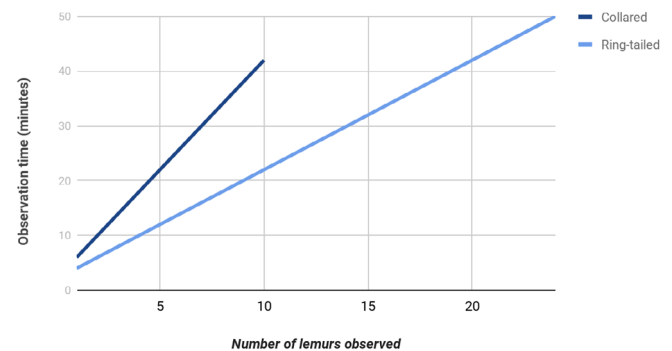
Math 2-3 Solution:

Ring-tailed lemur colony: 10 lemurs. Each lemur eats: 1 carrot, 3 broccoli stems, 6 poplar leaves. Ring-tailed colony eats: 10 bananas, 30 thistles, 60 poplar leaves. Collared lemur colony eats: 5 bananas, 15 thistles, 30 poplar leaves. Leftovers: 9 bananas, 3 thistles, 10 poplar leaves. With leftovers, you could feed 1 more lemur since you need 3 thistles per lemur.

Math 4-5 Solution:

If you spend 35 minutes with each colony, you observe 8 CL or 16 RT. If all lemurs are present, you spend 92 minutes (1 hour, 32 minutes) observing. If you spend the same time observing, you see twice as many ring-tailed lemurs as collared lemurs ($RT = 2 \times CL$).

Lemur Center Observation Times



References

Math K-1 activity is adapted from “Double Down” in “7 Games for Practicing Math Facts” at <https://www.scholastic.com/teachers/articles/teaching-content/7-games-practice-math-facts/>

Math 2-3 & 4-5 links:

- Lemur diet information from <https://lemur.duke.edu/discover/meet-the-lemurs/>
- Lemur colony information from <https://lemur.duke.edu/discover/meet-the-lemurs/>
- Ring-Tailed Lemur: <https://lemur.duke.edu/discover/meet-the-lemurs/ring-tailed-lemur/>
- Red Collared Lemur: <https://lemur.duke.edu/discover/meet-the-lemurs/red-collared-lemur/>

Math 6-7 link:

- Random Number Generator: <https://www.calculator.net/random-number-generator.html>

Math 8-9 activity is adapted from “Comparing Linear, Quadratic & Exponential Models” at <https://study.com/academy/lesson/comparing-linear-quadratic-exponential-models.html>

Math 10-12 links:

- 2017 World Happiness Report: <https://www.youtube.com/watch?v=Se2gfFKp1lw>
- Weighted Averages Example: <https://drive.google.com/file/d/1JCDvFsd4dLeMbRkHyTEFYsdlWWtRXu9/view>
- Gapminder Indicator Selector: <https://www.gapminder.org/data/>
- See the “Happiness” Full Lesson Plan for other guiding questions and examples: <https://blogs.tip.duke.edu/teachersworkshop/how-do-we-quantify-happiness/>