Always Looking Up: Nancy Grace Roman, Astronomer
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Curriculum Guide

English/Language Arts Activities

1. The text of ALWAYS LOOKING UP states that Nancy Grace had "curiosity as boundless as the universe."
   A) What other metaphors and similes can you find in the text?
   B) Try writing your own space-themed similes.

2. The back of the book features a timeline of important events related to Nancy Grace Roman and the Hubble Space Telescope. Write a similar timeline of important events in your own life. You can include whatever you want! Possibilities include when you said your first word, when you got a pet, when you started playing soccer, when you went on a family trip...or anything else!

3. An astronomer is a scientist who studies the universe and the celestial objects within the universe. What is a scientist who studies bugs called? What about a scientist who studies rocks? Or the ocean? What does a seismologist study? Or a microbiologist? Come up with a list of at least 10 different types of scientists and what each type of scientist studies.

4. Nancy Grace knew from a young age that she wanted to be an astronomer. A lot of kids have no idea what job they might want, and that's okay, too. Choose one of these three options to write about:
   A) If you have an idea of what job you might want when you grow up, write about that job and why you find it interesting.
   B) Write about a job you don't think you would want and why you are not interested in that job.
   C) Invent a job that doesn't actually exist (yet). Write an advertisement telling people about this exciting new job and explaining why they should apply.
Science Activity

Relative Planet Size
Kids know that some planets are bigger than others, but very few kids (or adults) understand just how much bigger some planets are. This activity will astonish them, as they see, for example, how tiny Earth is compared to Jupiter, and how much tinier Pluto is compared to Earth.

You will need a large ball—about 3 pounds—of soft modeling clay, Play-doh, or homemade playdough, and nine labeled paper plates for the nine planets to sit on.

1. Divide the dough into ten equal balls.
2. Squash six balls together. Place this on the plate labeled Jupiter.
3. Squash three more balls together. Place this on the plate labeled Saturn (but this is only part of Saturn).
4. Take the dough that is left and divide in half. Add one half to Saturn.
5. Divide the other half of the dough into five equal pieces.
6. Squash two pieces together. Place this on the plate labeled Neptune.
7. Take two more and squash them together. Place this on the plate labeled Uranus.
8. With that one little piece that is left, make ten equal pieces.
9. Put nine of those little pieces together and add to Saturn.
10. Divide the last little piece into two pieces. Put one of them on the plate labeled Earth.
11. Now divide the last piece into ten more pieces! Squish 9 of them together and place on the plate labeled Venus.
12. Now divide that last little piece into ten even smaller pieces! Squish 9 of them together and place on the plate labeled Mars.
13. Now divide that last tiny piece into ten even tinier pieces! Squish 9 together and place on the plate labeled Mercury.
14. Place the last piece on the paper labeled Pluto.

Now that students see how small Pluto is they may understand better the continuing controversy over whether Pluto should be counted as a planet or not.
Math Activities

1. **Estimation:** the text of ALWAYS LOOKING UP mentions that the Hubble Space Telescope was as big as a bus and as heavy as two elephants. Use those descriptions to estimate the length and weight of Hubble.

2. **How far can Hubble see into space?**

   *Hubble can see much further into space than most kids (or adults) can really imagine.*

   To get a sense of just how far Hubble can see, start with the concept of a light-year: a light year is how far light can travel in a year, which is about **5,865,696,000,000** miles!

   *Write this number someplace where all students can see it, or have each student write it out. Then, since Hubble can see 10 billion light-years away, add 10 more zeroes onto the end of that number. That’s approximately how many miles Hubble has seen into what is called the Hubble Deep Field.*

Art Activities

1. Constellations are groups of stars that form a picture, such as an animal (like Scorpius, which looks like a scorpion) or an object (like the Big Dipper, which looks like a big spoon). On a black piece of paper, use a white crayon or white paint to make your own constellation.

2. Go to [https://hubblesite.org/images/gallery](https://hubblesite.org/images/gallery) to see photographs captured by the Hubble Space Telescope. Using paints, crayons, oil pastels, or other art supplies, create a piece of art inspired by one of the photographs.

History/Research Extension

Nancy Grace visited the Soviet Union during the Cold War. This was a big deal, because during this time very few people from the United States were allowed to visit the Soviet Union. Research and discuss the following questions:

1. What was the Cold War?
2. What countries that exist today were part of the Soviet Union?
3. During the Cold War, the United States and the Soviet Union (USSR) engaged in a space race to see who could develop a space program first. What happened during the space race? Which space feats did the Soviet Union achieve first? Which space feats did the United States achieve first? Do you think having two countries racing to accomplish different feats in space was a good thing or a bad thing? Why or why not?