



BALANCING THE DAY AWAY IN GRADE 2

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Lesson Summary for Grade 2

Students spend the day learning about balance by playing with and making balancing toys. They discover how varying the amount and position of mass affects the toys' balance. This second-grade lesson includes links to art, mathematics, and social studies.

Science Activity 1: Balancing Stick

Students build and explore balance toys, and discover how varying the amount and position of mass affects the toys' balance.

Source: Taylor, B.A.P.; Poth, J.; Portman, D.J. *Teaching Physics with TOYS*; McGraw-Hill: New York, 1995; pp 45–52. (ISBN 007064721-6)

Key Science Topics:

- balance
- center of gravity

Key Process Skills:

- hypothesizing
- investigating

Archdiocese of Cincinnati Graded Course of Study Objectives:

8. observes objects and phenomena
9. identifies, describes, and classifies the properties of objects and phenomena
10. compares and contrasts objects and phenomena
23. recognizes cause and effect relationships
25. makes inferences
28. follows procedures
29. controls variables
32. predicts outcomes
310. identifies various types of forces
315. demonstrates gravity

National Science Education Standards:

A. Science as Inquiry Content Standard:

Abilities Necessary to do Scientific Inquiry:

- Ask questions about objects, organisms, and events in the environment.
- Plan and conduct a simple investigation.

B. Physical Science Content Standard: Properties of Objects and Materials:

- Objects have many observable properties, including size, weight, shape, color, temperature and the ability to react with other substances. Those properties can be measured using tools, such as rulers, balances and thermometers.

Science Activity 2: The Skyhook

Students explore gravity and balance while playing with the Skyhook, a popular pioneer toy.

Source: Taylor, B.A.P.; Poth, J.; Portman, D.J. *Teaching Physics with TOYS*; McGraw-Hill: New York, 1995; pp 53–58. (ISBN 007064721-6)

Key Science Topics:

- center of gravity
- gravity

Key Process Skills:

- observing
- hypothesizing

Archdiocese of Cincinnati Graded Course of Study Objectives:

8. observes objects and phenomena
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10. compares and contrasts objects and phenomena
15. records data
18. organizes information in written form
23. recognizes cause and effect relationships
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National Science Education Standards:

A. Science as Inquiry Content Standard:

Abilities Necessary to do Scientific Inquiry:

- Ask questions about objects, organisms, and events in the environment.
- Plan and conduct a simple investigation.
- Use data to construct a reasonable explanation.

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Science Activity 3: Balancing Butterflies

Family teams balance butterfly models and learn about the importance of the center of gravity.

Source: Sarquis, M.; Hogue, L. *Science Night Family Fun from A to Z*; Terrific Science Press: Middletown, Ohio, 2000; pp 33–43. (ISBN 188382221-1)

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- center of gravity

- balance

Key Process Skills:

- observing
- investigating
- hypothesizing

Archdiocese of Cincinnati Graded Course of Study Objectives:

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9. identifies, describes, and classifies the properties of objects and phenomena
10. compares and contrasts objects and phenomena
15. records data
16. records data graphically
18. organizes information in written form
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Science Activity 4: Keep Your Balance

Students learn that objects balance more easily when the center of gravity is below the support point.

Source: Gertz, S.E.; Portman, D.J.; Sarquis, M. *Teaching Physical Science Through Children's Literature*; McGraw-Hill: New York, 1996; pp 181–188. (ISBN 007064723-2)

Key Science Topics:

- balance
- gravity
- center of gravity
- engineering

Key Process Skills:

- hypothesizing

- investigating

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Possible Payout of the Lesson:

Begin the day by reading *Mirette on the High Wire* by E.A. McCully (Putnam: New York, 1992). Discuss what Mirette had to have in order to walk on the high wire. (balance) Discuss balancing. Where do the children use balancing? (on bicycles, skateboards, roller blades) Second-graders know how important balance is because many of them are just learning or have recently learned how to ride a two-wheeled bicycle. Have students list things that balance in their notebook. Do the children know of any toys that need to balance in order to work? (bikes, skateboards, birds on the platform, etc.) What kinds of people especially need balance? (ballet dancers, skaters, gymnasts, etc.) Have the students stand up and try to balance on one foot. Discuss why we don't fall when we stand on two feet.

Do the "Balancing Stick," "Skyhook," and "Keep Your Balance" science activities with students. If available, demonstrate the balancing cork fisherman from the "Balancing Act" handout distributed at the Summer Toys Course 1999. Ask the students to explain how it works.

Art Activity 1

Students color butterfly cut-outs.

Invite students to make balancing butterflies using the cut-outs from Science Activity 3: Balancing Butterflies. Have them color the butterflies before they are cut out. Then use paper clips to get the butterflies to balance.

Art Activity 2

Students illustrate circus balancing acts.

Talk about the circus with the class. What kind of acts can you see there? Invite children to draw or paint pictures of acts in the circus that use balance.

Mathematics Activity

Students experiment with balancing scales.

Introduce students to a set of balancing scales and show them how they work. Talk about their importance. Give the children opportunities to compare the mass of different objects with the balances. They can weigh objects in the classroom, use the objects as units of mass, and calculate how much they weigh in math books or board erasers.

Social Studies Activity

Students learn about the Leaning Tower of Pisa.

Tell students about the Leaning Tower of Pisa, explain how it is still standing, and the efforts to save the building from falling. Show children photographs of the famous landmark. Locate Italy on a map and compare its position on the map to the United States and to Ohio. The following resources may help:

- Carson, M.K. "Stopping the Toppling Tower," *SuperScience* 1998, 10 (2), 14–15.
- Kovacs, D. "The Tower of Pisa Construction: Taking Out the Lean," *Current Science* 1996, 81, 10–11.
- "Fall of the Leaning Tower," *Nova* television program, air date: Oct. 5, 1999, WGBH Boston (companion web site: <http://www.pbs.org/wgbh/nova/pisa/index.html>)

References

Haines, G.K. *Which Way is Up*; Atheneum: New York, 1987.

Branley, F.M. *Gravity is a Mystery*; Harper: New York, 1986.

Selsam, M.E. *Up Down and Around*; Doubleday: New York, 1977.