

Grade: 2 Subject: Science	Unit 1: Balance and Weighing
Big Idea/Rationale	<p><i>Balancing and Weighing</i> introduces students to the relationship between balance and weight.</p> <ul style="list-style-type: none"> • Experiences with a beam balance introduce students to the concept that amount of weight, position of weight, and position of the fulcrum affect balance. Work with an equal-arm balance challenges students to place objects in serial order on the basis of weight and to appreciate that weighing is the process of balancing an object against a certain number of standard objects. In the final lessons, students turn to a series of problem-solving investigations with the equal-arm balance and cupfuls of four different foods. These activities provide an opportunity to explore the relationship between weight, density, and volume.
Enduring Understanding (Mastery Objective)	<ul style="list-style-type: none"> • Balance is affected by the amount of weight, the position of weight, and the position of the fulcrum • Weighing is the process of balancing an object against a certain number of standard units • The weight of an object is not determined by size • When using an equal-arm balance to compare and weigh, a close range of results is valid
Essential Questions (Instructional Objective)	<ul style="list-style-type: none"> • What factors affect balance? • What methods can be used to determine and compare the weights of objects? • What factors affect weight? • Why do the same volumes of different materials have different weights? • When should an equal-arm balance be used? • How does a scientist communicate his or her ideas to others?
Content (Subject Matter)	<p>Lesson - 1: Thinking about Balance</p> <ul style="list-style-type: none"> • Students will examine the relationship between balance and weight with simple materials <p>Lesson – 2: Building Structures That Balance</p> <ul style="list-style-type: none"> • Students will assemble structures that balance using Unifix cubes, a beam & fulcrum to explore the interaction between balance and weight. <p>Lesson – 3 Exploring the Beam Balance</p> <ul style="list-style-type: none"> • Students will examine the effect of a change in weight and its position on the way a beam balances on a fulcrum <p>Lesson – 4 Moving the Fulcrum</p> <ul style="list-style-type: none"> • Students will examine the effect of the position of the fulcrum on balance

Lesson – 5 Building Mobiles

- Describe mobiles with various fulcrum points and change the balance by adding weights or shifting the position of weights.

Lesson – 6 Exploring the Equal Arm Balance

- Students will compare and construct the equal arm balance and the beam balance.

Lesson – 7 Using the Equal Arm Balance Compare Objects

- Students will experiment with a variety of objects and compare the results.

Lesson – 8 Developing Strategies for Placing Objects in Serial Order

- Students will plan strategies to place 4 objects in serial order – lightest to heaviest

Lesson – 9 Placing Six Objects in Serial Order.

- Students will appraise comparison making strategies to place 6 objects in serial order -- lightest to heaviest.

Lesson – 10 Balancing with Unifix Cubes.

- Students will discover the relationship between balancing and weighing

Lesson – 11 Graphing the Weights of the Objects

- Students will design bar graphs for the weight of objects, interpret data, draw conclusions and present information.

Lesson – 12 Describing the Four Foods

- Students will examine physical properties of 4 foods and tabulate the observations

Lesson – 13 Comparing Cupfuls of Food.

- Students will compare cupfuls of food and place them in serial order from lightest to heaviest.

Lesson – 14 Weighing Cupfuls of Food.

- Students will prepare a line plot to record results and analyze information.

Lesson – 15 Which Food Occupies the Most Space.

- Students will determine that equal weights of substances occupy different volumes.

Skills/ Benchmarks (CCSS Standards)	<ul style="list-style-type: none"> • 5.1.P.A.1: Display curiosity about science objects, materials, activities, and longer-term investigations in progress. • 5.1.P.B.1: Observe, question, predict, and investigate materials, objects, and phenomena (e.g., using simple tools to crack a nut and look inside) during indoor and outdoor classroom activities and during any longer-term investigations. • 5.1.P.B.2: Use basic science terms and topic-related science vocabulary. • 5.1.P.B.3: Identify and use basic tools and technology to extend exploration in conjunction with science investigations. • 5.1.4.B.2: Measure, gather, evaluate, and share evidence using tools and technologies. • 5.1.P.C.1: Communicate with other children and adults to share observations, pursue questions, and make predictions and/or conclusions. • 5.1.4.C.1: Monitor and reflect on one’s own knowledge regarding how ideas change over time. • 5.1.4.C.2: Revise predictions or explanations on the basis of learning new information. • 5.1.P.D.1: Represent observations and work through drawing, recording data, and “writing.” • 5.1.4.D.1: Actively participate in discussions about student data questions, and understandings. • 5.1.4.D.2: Work collaboratively to pose, refine, and evaluate questions, investigations, models, and theories. • 5.1.4.D.3: Demonstrate how to safely use tools, instruments, and supplies. • 5.2.P.A.1: Observe, manipulate, sort, and describe objects and materials (e.g., water sand, clay, paint, glue, various types of blocks, collections of objects, simple household items that can be taken apart, or objects made of wood, metal, or cloth) in the classroom and outdoor environment based on size, shape, color texture, and weight. • 5.2.2.A.1: Sort and describe objects based on the materials of which they are made and their physical properties. • 5.2.P.E.1: Investigate how and why things move (e.g., slide blocks, balance structures, push structures over, use ramps to explore how far and how fast different objects move or roll). • 5.2.2.E.1: Investigate and model the various ways that inanimate objects can move.
Materials and Resources	<ul style="list-style-type: none"> • STC Balancing & Weighing Kit • STC Balancing & Weighing Teacher’s Guide • Websites: <ul style="list-style-type: none"> ○ http://www.fossweb.com/modulesK-2/BalanceandMotion/index.html (Foss—Balance and Motion) ○ http://pandora.nla.gov.au/pan/67730/20070207-

	<p>0000/www.sofweb.vic.edu.au/steps/students/5-6Years/machines/frogs.html (Balancing Frogs)</p> <ul style="list-style-type: none">○ http://www.exploratorium.edu/snacks/center_of_gravity.html (Science Snacks—Center of Gravity)○ http://www.calder.org/#.html (Calder Foundation) <p>• Literature:</p> <ul style="list-style-type: none">○ McCully, Emily Arnold. <i>Mirette on the High Wire</i>. New York; The Putnam Publishing Group, 1992.○ Pallotta, Jerry. <i>Hershey's Chocolate Weights and Measures</i>. New York: Scholastic, 2002.
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