Activity Name	Suggested Audience/ Grade	Content Focus	Description	Additional Notes/extensions
		B=biology, C=chemistry, E=earth and space, G=engineering, P: physics, M=math, S=Science processing, T=ADST/technology, V=Environmental		
Anatomical Hand	5-7	B	Using paper and straws students will create an anatomical hand that is able to move with application to simple robotic principles.	Younger students may use toothpicks instead of straws to design a working hand.
Animal Adaptations	K-3	B	Through creativity and art students will learn about animal adaptations, and how animals are suited to their environments.	Can be adapted to older ages with different examples and more in-depth discussion including evolution.
Animal Camouflage	K-3	B, M	Using common materials as well as data collection techniques, students learn the importance of camouflage for survival.	This activity can be extended for older grades to include higher level data interpretation, use of graphing, and mathematics.
Artificial Selection and Genetics	6-10	B	Using a simulation, students will use artificial selection concepts to define and create species characteristics. Scientific reasoning of how this happens, and introduction of Mendelian inheritance is discussed.	Artificial selection and genetics concepts are the foundation of this lesson.
Backyard Brains and Electromyography	4+	B, T	Using Backyard Brains technology, small groups of students can witness the activity of neurons and muscle groups. This activity utilizes group work, as the amount of technology is limited. Extension activities related to reaction time are included with this lesson.	Currently there is limited equipment for the Backyard Brains, and can be delicate. The addition of the reaction time lab adds another data collection option.
Baking Soda and Vinegar Animals	K-3	C	Properties and states of matter also includes chemical and physical changes. This lesson illustrates changes related to chemical weathering and erosion.	Ideal for younger audiences.
Balloon Cars	4-7+	T, P	Students will use simple materials to build their own balloon powered car. Energy and force are discussed.	
Birdhouse Circuits	7-9	B, P, G	This project combines bird knowledge with circuitry to build a habitat-friendly birdhouse, including a working light. NOTE: Due to similar outcomes covered, it is recommended that Squishy Circuits and Birdhouse Circuits are not chosen within the same series.	This is best chosen for a longer class period, as construction, circuits, and other concepts require time to appropriately cover.
Blood and Circulation	5+	B, S	Following investigation and discussion of blood flow within the circulatory system, students will complete an activity involving physical movement and measuring effects on heart rate.	
Borax Bouncy Ball	3	C, P	In this lesson, students will create their own bouncy balls. Properties of matter and forms of energy in ball motion are discussed. Extension activities can include mathematical measurement concepts.	
Candy Colored Diffusion	K-1	C, M	Using candy, water, and a few other simple ingredients, students explore diffusion and mixing of colours, patterning, as well as design principles.	
Catapults	5-6	P	Using popsicle sticks and other materials, students design and test catapults. Application of concepts related to forces, simple machines, motion, and Newton's laws to explore how these machines work are included in this lesson.	Secondary extensions include quadratic and parabola discussions.
Chalk Erosion and Weathering	2-4	E	Using the scientific method, students will explore erosion and weathering with a hands-on activity.	Can be extended to older groups.

Climate Change Chemistry	3-9+	C, V	Students will investigate how climate change is affecting ocean acidification. Making natural indicators and testing substances at various pH are part of this lessons' fun.	
Colour Chromatography and Pigments	1+	C, P	Using the process of chromatography to explore how different colours can be separated in a variety of materials, such as pigments in leaves, or colours in markers.	
Crystal Ornaments	4-6	C	Students will use the concepts of solubility, solutions, evaporation, and crystal formation to create crystal structures. Please note: this activity may use very warm water to create crystals.	This activity sets overnight. Jars (big enough to hold a pipe cleaner shape, may need to be supplied by participants for the activity.
Dichotomous Key	4-6,11	B	Students will create a dichotomous key using keen observation skills. In doing this, they will gain appreciation of the importance these keys play in taxonomy and life.	
Digestive System Maze	4-6,11	B	Students create a maze, complete with a marble track, to mimic and explore the human digestive system.	
DNA Neuron Coding	10-12	B, T	Linking to concepts related to the nervous system, students use coding principles to bead DNA code and structures of a neuron.	
Drum Exploration	K-3	P	In this activity, students will experiment with different ways to build a drumhead as a way to explore the principles of sound.	
Ecosystem Structures	3-6	B, V	Students learn what factors living things need to survive through identifying the abiotic and biotic components of an ecosystem and describing the roles and interactions of producers and consumers within food chains and food webs.	The use of Ozobot technology to learn about food chains may be used for this activity.
Edison Robots and coding	2+	T	Students will be introduced to the Edison robots. This lesson can be adapted to different levels of coding--from simple coding for younger to advanced block coding for more advanced students seeking technology opportunities.	
Elastic and Inelastic Collisions	12	P, M	Students will actively engage in collision simulations while gathering measurements, and calculating factors such as momentum, and velocity. They will use these measurements and calculations to help discuss whether energy is conserved in different types of collisions.	
Elastic Energy	6	P	Students will explore different forces (balanced and unbalanced) by using elastics to design and build different apparatus and relate understanding to both kinetic and potential energy.	
Electromagnets	9-12	P	Through building and manipulating, students will create their own electromagnet, and manufacture a simple motor.	
Endocrine System Card Game	6,12	B	Using a simulation card game, students will learn about functions and feedback loops of different hormones.	
Enhance Your Ears	K-3	B	In this experiment, students will construct different ear models to investigate sound.	This is geared to a young audience, however can be extended for older audiences.
Equitable Shoes	9	G, T	Students work in teams to design a universal shoe which takes into consideration functionality, durability, and cost. Students will use TinkerCAD software design to develop a digital prototype, and potentially 3-D print their final prototype.	

Flower Dissection	1-3+	B	Students will investigate the different parts of a plant, to discuss diversity, importance of plants and pollinators, as well as the function of flowers.	
Gait Analysis	4+	B. P	Students will actively engate in looking at changes in gait when moving in different ways. The science of movement is always measureable and students will have the chance to look at different aspects of gait.	This lesson is currently in development and may not be available for the first series.
Harmonica and Sound	2-4	P	Students will use simple materials to learn how vibration causes sound.	
Heat Energy and Absorption using Colour	4-6	P, T	Students will use different colours to investigate effects on the transfer of heat energy. Introduction to heat energy is included in this activity.	
Joints, Muscles, Bones: Arm physiology	5+	B	Using musculoskeletal terminology, students will use everyday materials to construct and test simulated motion of the arm using the different anatomical components in the process.	
Kinetic Molecular Theory	8	C	Students will investigate the changes that exist in properties of hot and cold materials, as well as possible changes to size of objects at different temperatures.	
Lava Lamps	K-3	C	Students will explore properties of different kinds of matter and discuss density, through this guided chemistry experiment.	Students will need to provide individual clear water/drink bottles for this lesson.
Light Energy, EMR, Mirrors and Lenses	8	P	Students will investigate the different properties and characteristics of the electromagnetic spectrum. Observing laws of reflection as well as light passing through lenses will be explored.	
Lunar Cycle / Moon Phases	6	E	This lesson has a paper-based or an cookie-based option. Either option will culminate in a representation of the lunar cycle and phases of the moon therein.	
Magic Mud	K-6	C	Discussion of states of matter as well as testing properties of matter through hands on mixing of a non-Newtonian fluid are part of this fun (and sometimes messy) lesson!	
Magnet Exploration	K-3	P	This is an introductory lesson where students will categorize magnetic vs nonmagnetic objects through exploration of various materials.	
Makey Makey Technology	6+	T	Students will use the Makey-Makey Arduino to learn about circuits and properties used to support or hinder electrical current. By the end of the lesson, students should be able use alternative materials to help run computer applications.	Access to computers with standard USB ports are required for this activity.
Mars Rover Egg Drop	5-7	E, T	Learn about the Mars rover and participate in the engineering required to successfully drop an object from a height without causing damage. Discussions regarding gravity and forces will occur throughout this engineering building challenge.	Access to a staircase or outdoor play structure to test rovers from a height, is preferred.
Matter Exploration	K-4	C	Using simple substances, students will explore and visualize the differences between solids, liquids and gases. This activity involves using properties of matter to identify unknown solids.	
Mice Robots	K-3	G, M	Students will work with programmable mice robots, investigating very simple coding and programming. Mathematical principles of patterning and counting will also be included with this activity.	

Micro:bit Coding	4+	T	Use simple coding, and Micro:bit technology for collecting data and monitoring, operating Finch robots, or developing interactive interfaces. This lesson can be adapted to suit various learning outcomes. NOTE: access to computers with USB ports will be necessary.	Not suggested for younger audiences.
Mixtures: Heterogeneous and Emulsions	6	C	Students will investigate different types of solutions and emulsions. Simple ingredients are used to showcase differences between solutions, heterogenous mixtures, and the role of emulsifiers in creating miscible mixtures.	
Nature of Science	K-12	S	Through a hands-on activity, students will work to develop a scientific question, isolate variables, hypothesize, and understand different types of scientific investigations.	This activity focused on the process of Science.
Neuron Beading	K-6+	B, T	In this lesson students will learn about the role the nervous system plays in sending messages throughout the body, by creating a neuron key chain. This lesson is also used as an introductory lesson to coding as it combines message encryption with Morse Code to create a secret message as part of the neuron models "myelin sheath".	
Newton's 3 Laws: Cars in Motion	6	P	In this activity students will use different examples to test and demonstrate Newton's 3 Laws. They will explore; how mass, force, and motion are all connected to move objects; use different forces to generate motion; and observe the effects of these different forces.	
Oil Spill Clean-up	6-9+	C, V, S	Students will test and evaluate different methods of cleaning up an "oil spill" and determine which is best based on circumstances and/or stakeholders.	
Ozobot Action Potential	12	T, B, Coding	This lesson provides a detailed understanding of neurons and the human nervous system. Topics include action potentials and saltatory conduction.	
Ozobot Circulatory system	5-6	B, T	Students will use Ozobot technology to code/map and learn how blood travels around the body based on various scenarios.	
Ozobot Forest Economy	3-4	M, T	Students will have to work as a team to create an Ozobot assembly line that resembles the extraction, refinement, and use of a resource. They will need to figure out code and understand different costs and benefits through play.	
Ozobot Introduction	K-12	T, coding	Students will be introduced to small programable Ozobot robots. This lesson can be completed on its own or as a starting point for our more advanced Ozobot lessons.	
Ozobot Nervous System	K-6+	T, Coding	Using small programable Ozobot robots, students will learn how the nervous system functions in the human body.	Younger students may benefit from the "Ozobot Introduction" lesson, before doing this activity.
Ozobot Solar System	5-7	T, E, Coding	Students will create a working solar system using Ozobot technology. Extension challenges regarding the different orbital periods and dynamics of the solar system are available.	
Photosynthesis	3+	B, S	Plants play a large part in not only our breathing, but also in the carbon cycle. In this activity, students are introduced to a hands-on activity to investigate the process of photosynthesis.	
Pipe/Straw Rockets	6	G, E, P	Students will design, build, and launch paper rockets with pressure generated by air. Different aspects of flight will be covered.	
Plastic Milk	6	C	Students will separate a milk mixture into different components and make polymer shapes/designs using the separated casein protein.	A source to heat milk is required for this activity.

Q-Tip Skeleton	5	B	Students will learn why their bones are important while creating a skeletal model out of q- tips/cotton swabs.	
Rainsticks	K-3	P	In this activity, students will simulate the sound of rain through making a rainstick, a percussion instrument, which creates sound from seeds and rice bouncing against the inside of a cardboard tube.	
Reaction Time	K-6	B	Students will use the scientific method to help test and determine reaction times, related to body functions, particularly within the nervous system.	
Riparian Buffers and Stream Erosion	3-6	B, V	Students learn about riparian habitats and the role of riparian buffers that can protect waterways from harmful impacts. Students will model water erosion and compare amounts of runoff and soil loss generated from three different ground cover types.	
Rock Cycle	4-6	E	Using different physical and chemical tests, students will group rocks based on their appearance and properties and determine if they are metamorphic, sedimentary or igneous based on their results.	
Rockets on a String	6	E, P, G	Students will design and build rockets that use balloons as a means to propel them across the room. The activity will demonstrate Newton's 3rd Law.	
Rollercoasters (Marble)	6,9-12	G, M,	Option 1: Rollercoaster Energy Transfer: Students will design rollercoasters that will allow a marble to roll down a series of hills and curves. Testing their design and engineering skills as well as looking at the transfer of energy. Option 2: Polynomial Rollercoaster: Students will solve mathematical problems (polynomial and geometric) and build a working paper rollercoaster path to test hypotheses. Option 3: Rotational Motion Roller Coaster (Physics 12): Students will design and build working paper rollercoasters. Measurement and use of various formulae to determine conservation of energy in relation to the rotational motion exhibited in rollercoasters will be a key outcome.	Please note: This lesson will be adapted to fit grade level requests.
Salmon Life Cycles	K-3	B, V, T	Through hands-on interactive activities, students will explore the fascinating life cycles of five species of Pacific Salmon found in BC.	Optional by request: Ozobot technology may be used to help illustrate lifecycles.
Salt & Ice Melt	K-3	C	Using the scientific method, participants will experiment with ways to most effectively melt ice.	This activity can be extended for older grades if including topics of controlled experimentation and plant germination.
Scratch Coding Introduction	6	T,	Students will use the Scratch interface to learn simple block coding and design animations. Note: access to computers/tablets/mobile phones is required. WWEST can create curriculum themes to suit grade level topics upon request.	Younger grades can adapt this lesson to use Scratch Jr apps on tablets.
Soap Making	1-3	C, P	Students will be involved in utilizing land-based and synthetic materials to create a small bar of soap while observing the changing state of matter using thermal energy.	Access to a microwave by WWEST staff will be required.
Solar Oven	4+	G, E, P, V	Students will use a variety of materials to design, build and test solar ovens, using the sun as its heat energy source.	This lesson is most successful during periods of higher outdoor temperatures.
Squishy Circuits	4-9	P, T	Students will create a working circuit. Older students will use this lesson to gain a better understanding of Ohm's Law. NOTE: Do not select both "Squishy Circuits" and "Birdhouse Circuits" within the same series, as similar concepts are covered.	
Tallest Tower	K-9	G,	Students will use the engineering design process and a variety of materials to construct a tower. The goal is to ensure this tower can also withstand an "earthquake".	

Things that Fly	4-7+	P, G	Students will use concepts related to motion, flight, and machines to build things that fly. The class will construct helicopters and slingshot gliders that will test these concepts. Students will have time to modify designs to see if they can create better machines.	There is an option to increase the math concepts involved in geometry, measurement and scale.
Vertical Jump Test/Analysis	4+	P, S, B	Students will test and explore changes to vertical jumps heights based on different variables. They will see different ways to change and test vertical jump heights.	This lesson is currently in development and may not be available for the first series.
Water Cycle	2	E	Students will use scientific terms while investigating different parts of the water cycle.	Not suitable for older grades.
Water Filtration	2+	G, V, S	Students will use land-based and synthetic items to design, build and test water filters to determine their effectiveness.	
Water Quality Bug Detectives	6+	B, V	This activity helps students make the connection between aquatic life in a stream and water quality. Discussions include tolerant vs. intolerant species and considerations as to their classifications.	
Water Quality Chemical Indicators	6+	C, V	Students analyze water samples from different water bodies and learn how to conduct relevant water quality tests to determine the health of the water system.	
Watershed Explorations	3+	B, V,	By collaboratively building models of watersheds, students examine the basic geography of a watershed, how water flows through the system, and how people can impact the quality of water.	
Wind Turbine	4+	P, V, T	Students will investigate different forms of energy and make a simple wind turbine. Discussion and design will be included to share how wind can be used for different purposes, and be a renewable resource.	
Work of Walking	5+	P, B, M	Students will test different parts of walking and stair climbing. They will measure angles, distances and will use simple calculations to record work and power.	This lesson is currently in development and may not be available for the first series.