

# Outdoor science and math workshop offerings

Grade	Biology	Physics	Earth Science	Math
K	<p><b>Topic: Needs of Living Things</b></p> <ul style="list-style-type: none"> <li>· <a href="#">Woodbug/worm</a> study</li> <li>· <a href="#">Woodbug/worm</a> habitat for the classroom (need cool location)</li> <li>· <a href="#">Pond dipping</a> (check availability)</li> <li>· Plant features: <a href="#">Root shapes</a>, <a href="#">Plant vessels</a>, <a href="#">Leaf drip tips and waxy coatings</a></li> <li>· At the beach: <a href="#">Seaweed study</a>, <a href="#">Barnacles</a>, <a href="#">Beach life bingo</a></li> <li>· <a href="#">Bird feeders</a></li> </ul>	<p><b>Topic: Motion, Pushes, Pulls</b></p> <ul style="list-style-type: none"> <li>· Playground forces: <a href="#">Forces on the equipment</a> and <a href="#">Bouncing balls</a></li> <li>· Rockets: <a href="#">Balloon rockets</a>, <a href="#">Baking soda/vinegar demonstration rocket</a></li> <li>· <a href="#">Balancing sculpture</a></li> <li>· <a href="#">Catapult from popsicle sticks</a></li> </ul>	<p><b>Topic: Weather and Seasons</b></p> <ul style="list-style-type: none"> <li>· Measuring weather: <a href="#">Thermometers</a>, <a href="#">Anemometers</a>, <a href="#">Rain gauge</a></li> <li>· <a href="#">Make rainbows</a></li> <li>· <a href="#">Bird feeders</a> (late Fall/Winter)</li> <li>· <a href="#">Seed hunt and study</a> (Fall)</li> </ul>	<p><b>Topic: Patterning</b></p> <ul style="list-style-type: none"> <li>· Make repeating patterns from rocks and leaves</li> <li>· Hunt for patterns on the playground</li> <li>· Draw chalk patterns</li> </ul> <p><b>Topic: Measuring and Graphing</b></p> <ul style="list-style-type: none"> <li>· Sort rocks/leaves of different sizes</li> <li>· Concrete graphing with leaves, pine cones etc.</li> </ul>
1	<p><b>Topic: Classification, Behaviour</b></p> <ul style="list-style-type: none"> <li>· <a href="#">Woodbug/worm</a> study</li> <li>· <a href="#">Woodbug/worm</a> habitat for the classroom (need cool location)</li> <li>· <a href="#">Collecting and classifying life</a></li> <li>· <a href="#">Pond dipping</a> (check availability)</li> <li>· Plant features: <a href="#">Root shapes</a>, <a href="#">Plant vessels</a>, <a href="#">Leaf drip tips and waxy coatings</a></li> <li>· <a href="#">Flower colours</a></li> <li>· <a href="#">Camouflage challenge</a></li> <li>· At the beach: <a href="#">Seaweed study</a>, <a href="#">Barnacles</a>, <a href="#">Beach life bingo</a></li> </ul>	<p><b>Topic: Light and Sound</b></p> <ul style="list-style-type: none"> <li>· Light and colour: <a href="#">Rainbows from light</a>, <a href="#">Colour filters</a></li> <li>· On a sunny day: <a href="#">Shadow shapes</a>, <a href="#">Shadows and mirrors</a>, <a href="#">Sundial</a></li> <li>· Mechanics of sound: <a href="#">String telephone</a>, <a href="#">Hummer</a> or <a href="#">Sound sandwich</a></li> <li>· Sound game: <a href="#">Sounds in a box</a></li> <li>· Animal hearing: <a href="#">Hearing through our bones</a> and <a href="#">Noise pollution game</a></li> </ul>	<p><b>Topic: Weather and Seasons</b></p> <ul style="list-style-type: none"> <li>· Measuring weather: <a href="#">Thermometers</a>, <a href="#">Anemometers</a>, <a href="#">Rain gauge</a></li> <li>· <a href="#">Sundial</a></li> <li>· <a href="#">Make rainbows</a></li> <li>· <a href="#">Bird feeders</a> (late Fall/Winter)</li> <li>· <a href="#">Seed hunt and study</a> (Fall)</li> </ul>	<p><b>Topic: Patterning</b></p> <ul style="list-style-type: none"> <li>· Make repeating patterns from rocks and leaves</li> <li>· Hunt for patterns on the playground</li> <li>· Make chalk patterns</li> </ul> <p><b>Topic: Measuring and Graphing</b></p> <ul style="list-style-type: none"> <li>· Non-standard measurement of playground objects and plants</li> <li>· Concrete graphing with leaves, pine cones etc.</li> <li>· Count and graph pictorially: plant types/car colours</li> </ul>

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2	<p><b>Topic: Life Cycles</b></p> <ul style="list-style-type: none"> <li>• Pollination: <a href="#">Flower colours</a>, <a href="#">Posting game with pollinators</a>, <a href="#">Pollen collection</a>, <a href="#">Flower and apple dissection</a>, <a href="#">Insects on flowers bingo</a> (with availability), <a href="#">Bee vision UV patterns on flowers</a></li> <li>• Seeds: <a href="#">Seed hunt and study</a> and <a href="#">Paper helicopters</a> (Fall), <a href="#">Seed dissection</a>, <a href="#">Plant seeds</a> (Spring)</li> <li>• <a href="#">Nurse log study</a> (with availability)</li> <li>• <a href="#">Deer skeleton and life cycles</a> (requirement: dry ground to work on)</li> <li>• <a href="#">Egg structure study</a></li> </ul>	<p><b>Topic: Types of Forces</b></p> <ul style="list-style-type: none"> <li>• Playground forces: <a href="#">Forces on the equipment</a>, <a href="#">Bouncing balls</a></li> <li>• Balance: <a href="#">Balancing pole</a>, <a href="#">Balancing sculpture</a>, <a href="#">Balance point on a stick or ruler</a>, <a href="#">Mobile</a></li> <li>• <a href="#">Flying hoopster</a></li> <li>• <a href="#">Paper airplanes</a></li> <li>• <a href="#">Pinwheel</a></li> <li>• <a href="#">Catapult from popsicle sticks</a></li> <li>• Rockets: <a href="#">Balloon rockets</a>, <a href="#">Baking soda/vinegar demonstration rocket</a></li> <li>• <a href="#">Friction on a bike</a></li> <li>• On a sledding hill: <a href="#">Friction on snow</a></li> </ul>	<p><b>Topic: Water cycle</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Water cycle bracelet</a> and <a href="#">Posting game with water cycle words</a>.</li> </ul>	<p><b>Topic: Patterning</b></p> <ul style="list-style-type: none"> <li>• Make repeating (positional) patterns with rocks, leaves and chalk</li> <li>• Hunt for circular patterns in flowers and leaf growth patterns</li> </ul> <p><b>Topic: Measuring and Graphing</b></p> <ul style="list-style-type: none"> <li>• Measure leaf length, plant height and playground structure size</li> <li>• Count and graph car colours or flower petal numbers</li> </ul>

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3	<p><b>Topic: Biodiversity, Food Chains.</b></p> <ul style="list-style-type: none"> <li>· <a href="#">Woodbug/worm</a> study and decomposers</li> <li>· <a href="#">Habitat survey and food web</a> or <a href="#">Soil habitat study and food web</a></li> <li>· <a href="#">Pond dipping</a> (with availability)</li> <li>· <a href="#">Kingdoms of life hunt</a></li> <li>· <a href="#">Native Plant Bingo</a> (with availability of native plants)</li> <li>· <a href="#">Nurse log study</a> (with availability)</li> <li>· At the beach: <a href="#">Habitat survey and food web</a>, <a href="#">Seaweed study</a>, <a href="#">Barnacles</a>, <a href="#">Beach life bingo</a></li> <li>· Plant feature biodiversity: <a href="#">Root shapes</a>, <a href="#">Leaf drip tips and waxy coatings</a>, <a href="#">Flower colours</a>, <a href="#">Plant smell molecule game</a></li> <li>· Animal feature biodiversity: <a href="#">Teeth</a>, <a href="#">Eyes</a>, <a href="#">Feet</a>, <a href="#">Feeding methods</a></li> <li>· <a href="#">Food web model</a></li> <li>· <a href="#">Deer skeleton and food web</a> (requirement: dry ground to work on)</li> </ul>	<p><b>Topic: Thermal energy</b></p> <ul style="list-style-type: none"> <li>· Activities on making heat e.g. running, hand friction, hand warmer, heat from the sun</li> </ul>	<p><b>Topic: Landforms</b></p> <ul style="list-style-type: none"> <li>· <a href="#">Build landforms from topography pattern</a> (need dry weather or undercover space)</li> <li>· <a href="#">Posting game with landform words</a></li> <li>· <a href="#">Weathering rocks</a></li> <li>· <a href="#">Erosion and Stream flow</a></li> </ul>	<p><b>Topic: Patterning</b></p> <ul style="list-style-type: none"> <li>· Hunt for circular patterns in flowers and leaf growth patterns</li> <li>· Use chalk to write number patterns</li> </ul> <p><b>Topic: Measuring and Graphing</b></p> <ul style="list-style-type: none"> <li>· Measure and calculate perimeter and area of rectangular outside areas</li> <li>· Measure air temperature</li> <li>· Make a sundial to measure the sun's position</li> <li>· Count and graph car colours or flower petal numbers</li> </ul>

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4	<p><b>Topic: Sensing</b></p> <ul style="list-style-type: none"> <li>• Eye activities: <a href="#">Eye study</a>, <a href="#">Lens inverts an image</a>, <a href="#">Blind spot</a> and <a href="#">Colour reversal illusion</a></li> <li>• <a href="#">Visual deprivation walk</a></li> <li>• <a href="#">Eyes in predators and prey</a></li> <li>• Insect sensing: <a href="#">Flower colours</a>, <a href="#">Bee vision UV patterns on flowers</a>, <a href="#">Bee pheromone molecules</a></li> <li>• Animal hearing: <a href="#">Sound frequency detection</a>, <a href="#">Hearing through our bones</a>, <a href="#">Noise pollution game</a></li> <li>• Smell matching games: <a href="#">Plant smell matches and molecules</a>, <a href="#">Posting game with smell molecules</a>, <a href="#">Smell pairs: herbs and plants</a></li> <li>• Taste: <a href="#">Taste bud observation</a>, <a href="#">Taste and smell for identifying candy flavours</a></li> </ul>	<p><b>Topic: Energy transformation</b></p> <ul style="list-style-type: none"> <li>• Energy transformations on the playground: <a href="#">Playground equipment</a> and <a href="#">Double bouncing balls</a></li> <li>• <a href="#">Catapult from tin can</a></li> <li>• <a href="#">Jumping stick</a></li> <li>• <a href="#">Shooter</a> (hazardous; needs a controlled environment)</li> <li>• Rockets: <a href="#">Baking soda/vinegar demonstration rocket</a>, <a href="#">Mini film canister rockets</a>, <a href="#">Stomp rocket</a>, <a href="#">Air pressure rocket demonstration</a></li> <li>• Sound calculations: <a href="#">Speed of sound calculation</a> (need an open field next to a large flat wall), <a href="#">Doppler effect</a></li> </ul>	<p><b>Topic: Earth's orbit, sun, moon</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Scale model of Earth's orbit and its Moon</a></li> <li>• <a href="#">Sun dial</a> (need a sunny day)</li> </ul>	<p><b>Topic: Patterning</b></p> <ul style="list-style-type: none"> <li>• Hunt for circular patterns in flowers and leaf growth patterns</li> </ul> <p><b>Topic: Geometry</b></p> <ul style="list-style-type: none"> <li>• <a href="#">mobius strips</a></li> <li>• use mirrors to explore line symmetry in plants</li> </ul> <p><b>Topic: Measuring and Graphing</b></p> <ul style="list-style-type: none"> <li>• Calculate perimeters of outside polygons</li> <li>• Measure air temperature</li> <li>• Make a sundial to measure the sun's position</li> <li>• Count and graph car colours or flower petal numbers</li> </ul>
5	<p><b>Topic: Organ systems (digestive, musculoskeletal, respiratory, circulatory)</b></p> <ul style="list-style-type: none"> <li>• Muscles: <a href="#">Feel muscle contractions</a>, <a href="#">Balancing and centre of mass in your body</a></li> <li>• Circulatory system: <a href="#">Blood pulse and heartbeat</a> activities</li> <li>• Comparative anatomy: <a href="#">Deer skeleton</a> (requirement: dry ground to work on), <a href="#">Clam dissection</a>, <a href="#">Worm study</a></li> </ul>	<p><b>Topic: Simple machines</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Lever for lifting a rock</a> (note: need to find a good rock on the school grounds)</li> <li>• <a href="#">Household levers</a></li> <li>• <a href="#">Levers: how bats and rackets work</a></li> <li>• <a href="#">Pulleys to lift a heavy load</a></li> <li>• <a href="#">Catapult from tin can</a> (lever)</li> <li>• <a href="#">Simple machines on a bike</a></li> </ul>	<p><b>Topic: Rock cycle, Resources</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Sedimentary rock formation</a> (need dry weather or undercover space)</li> <li>• Rock studies: <a href="#">Sand study</a> (need a dry space to work), <a href="#">Granite mineral study</a></li> <li>• <a href="#">Mineral testing: hardness and streak colour</a></li> <li>• <a href="#">Soil component study</a></li> <li>• <a href="#">Erosion</a></li> <li>• Water: <a href="#">Water pH testing</a> and <a href="#">Filtering water</a></li> <li>• <a href="#">Oil spill clean up model</a></li> </ul>	<p><b>Topic: Geometry</b></p> <ul style="list-style-type: none"> <li>• <a href="#">mobius strips</a></li> <li>• use flat mirrors and folding mirrors to find leaves and flowers with line and rotational symmetry</li> </ul> <p><b>Topic: Measuring and Graphing</b></p> <ul style="list-style-type: none"> <li>• Measure then calculate outside areas and perimeters.</li> <li>• Measure air temperature</li> <li>• Make a sundial to measure the sun's position</li> <li>• Count and graph car colours or flower petal numbers</li> </ul>

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6	<p><b>Topic: Organ systems (excretory, reproductive, hormonal, nervous)</b></p> <ul style="list-style-type: none"> <li>Nervous system activities including <a href="#">Reaction time</a></li> </ul>	<p><b>Topic: Newton's Laws</b></p> <ul style="list-style-type: none"> <li>Rockets: <a href="#">Baking soda/vinegar demonstration rocket/Mini film canister rockets</a> / <a href="#">Stomp rocket</a> / <a href="#">Air pressure rocket</a> / <a href="#">Balloon rocket</a></li> <li><a href="#">Catapult from tin can</a></li> <li><a href="#">Paper airplanes</a></li> <li><a href="#">Helicopter and launcher</a> TEST</li> <li><a href="#">Hoopster</a></li> <li>Forces in balance: <a href="#">Balancing pole</a>, <a href="#">Balancing sculpture</a>, <a href="#">Balance point on a stick or ruler</a>, <a href="#">Mobile</a></li> </ul>	<p><b>Topic: Solar system, Space exploration</b></p> <ul style="list-style-type: none"> <li><a href="#">Solar system scale model</a></li> <li><a href="#">Spectroscope</a> to look at the sun's spectrum with <a href="#">Doppler effect</a> analogy of red shift.</li> <li>Rockets: set off <a href="#">Baking soda/vinegar demonstration rocket/Mini film canister rockets</a>. Model <a href="#">real rocket chemistry</a> (need dry day).</li> <li><a href="#">Moon regolith</a> model</li> </ul>	<p><b>Topic: Geometry</b></p> <ul style="list-style-type: none"> <li><a href="#">mobius strips</a></li> <li>use flat mirrors and folding mirrors to find leaves and flowers with line and rotational symmetry</li> <li>use folding mirrors and protractors to <a href="#">measure mirror angle and image number</a></li> <li>find trees positioned to make different triangle shapes</li> <li>measure angles between cracks in concrete</li> <li>measure tree height using protractor and ratios</li> </ul> <p><b>Topic: Measuring and Graphing</b></p> <ul style="list-style-type: none"> <li>Measure then calculate outside areas and perimeters.</li> <li>Measure air temperature</li> <li>Make a sundial and measure the angle moved each hour</li> <li>Count and graph car colours passing at different times of day</li> <li>Count and graph flower petal numbers for different kinds of flowers</li> <li>Measure bounce heights for different balls</li> <li>Use a stopwatch to time the period of playground swings with different chain lengths</li> </ul>

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7	<p><b>Topic: Evolution</b></p> <ul style="list-style-type: none"> <li>· <a href="#">Natural selection game</a></li> <li>· <a href="#">Camouflage challenge</a></li> <li>· Animal adaptations: <a href="#">Mammal skeleton</a> (requirement: dry ground to work on), <a href="#">Teeth</a>, <a href="#">Eyes</a>, <a href="#">Opposable thumbs</a></li> <li>· <a href="#">Animal feeding method adaptations</a></li> <li>· <a href="#">Flower colour</a> evolution</li> <li>· Plant adaptations: <a href="#">Root shapes</a>, <a href="#">Leaf drip tips and waxy coatings</a>, <a href="#">Plant smell molecules game</a>, <a href="#">Plant smell matches and molecules</a></li> <li>· Biodiversity: <a href="#">Kingdoms of life hunt</a></li> </ul>	<p><b>Topic: Electricity</b></p> <ul style="list-style-type: none"> <li>· Electricity activities can be conducted outside if it is dry e.g. <a href="#">Electric circuits free play</a>, <a href="#">Electromagnet</a>, <a href="#">Electrolysis</a></li> </ul>	<p><b>Topic: Fossils. Climate change and Human impacts.</b></p> <ul style="list-style-type: none"> <li>· <a href="#">Oil spill clean up model</a></li> <li>· <a href="#">Fossil formation in sedimentary rock model</a> (weather must be dry)</li> <li>· <a href="#">Noise pollution game</a> and <a href="#">Hearing through our bones</a></li> <li>· <a href="#">Water filtration</a></li> </ul>	<p><b>Topic: Geometry</b></p> <ul style="list-style-type: none"> <li>· <a href="#">mobius strips</a></li> <li>· use flat mirrors and folding mirrors to find leaves and flowers with line and rotational symmetry</li> <li>· use folding mirrors and protractors to <a href="#">measure mirror angle and image number</a></li> <li>· find trees positioned to make different triangle shapes</li> <li>· measure angles between cracks in concrete</li> <li>· measure tree height using protractor and ratios</li> </ul> <p><b>Topic: Measuring and Graphing</b></p> <ul style="list-style-type: none"> <li>· Measure then calculate outside areas and perimeters.</li> <li>· Measure air temperature</li> <li>· Make a sundial and measure the angle moved each hour</li> <li>· Count and graph car colours passing at different times of day</li> <li>· Count and graph flower petal numbers for different kinds of flowers</li> <li>· Measure bounce heights for different balls</li> <li>· Use a stopwatch to time the period of playground swings with different chain lengths</li> </ul>

For your time slot fill in:

- Your **division**

- How many **students** in your class
- Your **email**, for a workshop reminder two days before, and if you want to communicate with me about what I will bring
- The **topic** you want (either general or specific for your grade level), or a particular **activity** you want