**Application Form for Grades K – 12**

**Projects, presentations, materials and resources in Yukon Schools**

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| Application for: Projects, Presentations \_\_~~X~~\_\_\_Resources, Materials \_\_\_X\_\_ |
| Agency/Department: **Yukon Science and Technology Advisory Society**Date of Submission: **February, 2020**Contact Name: **Rick Karp, President, YSTAS** Phone Number: **867-332-4036**Email: rickkarp46@gmail.com  |
| Request initiated by: **YSTAS – Yukon Science and Technology Advisory Society** |
| Title of project, presentation, resource or material: **Promoting STEM from K-12 in Yukon Schools.** |
| Grade | [Subject](https://curriculum.gov.bc.ca/curriculum) | Big Ideas | Curricular Competencies | Content |
| **Grade 5** | **Science** | **Machines are devices that transfer force and energy.** | **Questioning and Predicting:**Demonstrate a sustained curiosity about a scientific topic or problem of personal interest.Identify questions to answer or problems to solve through scientific inquiry.Make predictions about the findings of their inquiry.Planning and conducting:With support, plan appropriate investigations to answer their questions or solve problems they have identified.Choose appropriate data to collect to answer their questions.Observe, measure, and record data, using appropriate tools, including digital technologiesEvaluating:Demonstrate an understanding and appreciation of evidence.Identify some of the social, ethical, and environmental implications of the findings from their own and others’ investigations. | **Simple Machines, Gears!**This simple experiment teaches children about gears. Gears are important for kids to learn about and understand because they have many uses including in cars, toys, electronics, and clocks. They are used to transmit motion and force over a distance. They can be used to change the direction of motion and also to multiply or reduce a force. Interlocking gears into a series is called a gear train.Materials: Large plastic gears, pin magnets, magnetic dry erase board.Children place the gears in any pattern they like and affix them to the board with the magnets. They can then manipulate them in any fashion they wish. **Age range: 6-10** |
| **Grade 10** | **Science** | DNA is the basis for the diversity of living things. | **Questioning and Predicting:** Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal interest.**Planning and conducting:**Collaboratively and individually plan, select, and use appropriate investigation methods, including field work and lab experiments, to collect reliable data.Assess risks and use appropriate equipment, including digital technologies, to collect and record data.Ensure that safety and ethical guidelines are followed.**Processing and analyzing data and information:**Seek and analyze patterns, trends, and connections in data, including describing relationships between variables (dependent and independent) and identifying inconsistencies.  | **Extracting DNA from fruit!**This simple experiment will show you how to extract DNA from fruit like a banana or strawberry. Materials: Half of a banana, kiwi, or strawberry, Coffee filter, 4 teaspoons 91% isopropyl alcohol – chilled (easily sourced at Shoppers), 2-3 pinches of salt, 2 teaspoons clear shampoo, Eye dropper, 3 plastic cups, Small test tube or glass, Water.1. Mix shampoo, salt and 4 tsp of tap water. Try not to create bubbles.
2. In a separate cup, mash the fruit and a little water into a pulp.
3. Add 4 tsp. of fruit mush to shampoo/salt mixture. Gently mix until it is a uniform consistency. Try not to make too many bubbles.
4. Place the coffee filter in a cup then carefully pour the shampoo/fruit mixture into filter. Filter until there is about 2 tsp of fluid in the cup.
5. Pour alcohol into small glass or test tube. Using the eye dropper, pick up filtered fruit fluid and slowly drop it into the container of alcohol. Don’t shake it! Observe the DNA that appears.

Age range: 10-16 |
| **Grade 11** | **Science** | Life is a result of interactions at the molecular and cellular levels. | **Questioning and predicting:**Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal, local or global interest.Make observations aimed at identifying their own questions, including increasingly abstract ones, about the natural world.Formulate multiple hypotheses and predict multiple outcomes.**Processing and analyzing data and information:**Seek and analyze patterns, trends, and connections in data, including describing relationships between variables, performing calculations and identifying inconsistencies.Use knowledge of scientific concepts to draw conclusions that are consistent with evidence.Analyze cause-and-effect relationships.**Evaluating:**Assess risks in the context of personal safety and social responsibility.Consider social, ethical, and environmental implications of the findings from their own and others’ investigations.Connect scientific explorations to careers in science. | **Bacteria and the Immune System.** A presentation on bacteria as well as the human immune system. Using slides showing bacteria students study what bacteria looks like under the microscope. Each student picks a slide showing a type of bacteria to present it in front of the class the following day. So, a member of YSTAS is there to explain about bacteria and the immune system, and answer questions about the specific bacteria each student has chosen for their presentation and how our immune system responds.Age range 14-18 |
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| How will this presentation, project, resource or material enhance Yukon schools?***Working with the staff at Yukon Schools YSTAS membership will bring an element of excitement into the classroom as well as a stimulating*** ***experience from our “Science in a Box” program designed specifically for various grade levels. The main objective of these classroom visits is to get students interested in STEM from elementary school to grade 12. Using the experiment, compare, formalize and understand cycle we will inform students of the many aspects of STEM through first hand experiences in the classroom and being face to face with YSTAS experts.******As well, our highly educated membership will support teachers through training and development workshops during PD days, and upon request from teachers.*** |
| Please list and attach any professional review of this work. ***Representatives from YSTAS have been in the French School (EET), at the High School level, for the past year. They have had great results, and have been asked back on an ongoing basis.*** ***Also, we have initiated, on the suggestion of Paula Thompson, discussions with Brenda Sherry, of the ‘Connected North’ pilot project and we are working toward partnering with Brenda and her team to help achieve the goals of the Department. Both YSTAS and Connected North are proposing similar work, with two exceptions: one, Connected North is focusing attention on First Nations students and the communities, and two, Connected North is using Virtual Technology. YSTAS is focusing on the Whitehorse area and are in the classrooms, face to face with students and teachers at EET and now hopefully the English side of the department.******Finally, we are also starting a dialogue with Dan Anton at the College, who is working to develop STEM activities for youth focusing on a summer camp and the communities; and we met with NRCan, at their request, when they were in Whitehorse. Among other things, NRCan is also looking to develop an interest in STEM among youth in the north.***  |
| Any additional information that you would like to supply should be provided on separate pages.***Please see attached an introduction to YSTAS and examples of the contents and make-up of the “Science in a Box” program.*** |
| Forward application to the Project Approval Committee: curriculum@gov.yk.ca |
| Department Resource Committee Review Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Approved: Yes \_\_\_\_\_ No \_\_\_\_\_Reasons if application is declined:  |
| Approved for:  |
| Restrictions, if any:  |