Teacher Guide to Kinesiology Video

With a renewed focus on inquiry, BC’s re-designed Science curriculum provides students with opportunities to ask questions, identify their beliefs and opinions, consider a range of views, work collaboratively, and ultimately make informed conclusions that lead to responsible choices for themselves, their families, and their communities.

Inquiry processes are complex and students, especially younger ones, will need a great deal of guidance and practice. The three videos produced by Simon Fraser University are helpful in framing Inquiry for students of many ages and abilities. Each one is designed to be shared in small “bite-size” portions that offer time for student reflection and application of the ideas presented. The information below is organized to align the structure of the re-designed curriculum (which follows the Scientific Method) with the viewing process suggested by each video.

After some initial exposure to the concepts of Inquiry and Kinesiology, begin the short Kinesiology video.

**PAUSE Question # 1 on screen:**

*Why do you think Uma and Leone’s hearts are beating harder than normal?*

Keep asking the students “why?”

Students may respond to the screen prompt with, “Because they were running” or “That always happens when you move/run”.

Ask them to consider WHY the heart beats faster when we move? Does it beat faster for everyone? Is the after run heart rate (HR) the same for everyone i.e. does everybody’s heart beat 76 times per minute when they run? Or even does everybody’s heart rate increase by 30 beats per minute (regardless of the resting HR)?

Deeper, more personally relevant questions promote inquiry and genuine interest in the topic and may lead to richer learning over the whole unit.

**Curricular Competencies addressed**
(all taken from Gr 7 science; adjust as needed for your grade, though they are very similar K-9):

- Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal interest
- Make observations aimed at identifying their own questions about the natural world
Identify a question to answer or a problem to solve through scientific inquiry

**PAUSE Question #2 on screen:**

*Which activity do you think will raise Uma and Leone’s heart rate the most: walking, running or doing jumping jacks?*

Encourage students to make predictions and to justify their ideas with evidence from personal experience or scientific prior knowledge. Scientists make hypotheses which are educated guesses, not random ideas, based on their observations and personal research or based on the research and experimentation other scientists have accomplished.

**Curricular Competencies addressed:**

- Formulate alternative “If…then…” hypotheses based on their questions
- Make predictions about the findings of their inquiry

**PAUSE Question # 3 on screen:**

*Can you help them? How long should Uma and Leone do the activities for and how can you measure their heart rates?*

Have students discuss possible strategies for determining which activity will have the greatest impact on heart rates. You may wish to pre-teach or review the concepts of variables, accurate data collection, sources of error, experiment design, etc.

**Curricular Competencies addressed:**

- Collaboratively plan a range of investigation types, including field work and experiments, to answer their questions or solve problems they have identified
- Measure and control variables (dependent and independent) through fair tests

Watch more video. Students can compare their experimental design ideas with what Alex and Leona do. Did students consider reasonable timing of the activities; rest time between activities; technology or
PAUSE Question # 4 on screen:
Now you try your experiment! Remember to take your heart rate right before, right after and 2 minutes after you do these three activities.
Which one do you think will be the highest? Why?
Record your observations in a chart like Alex did
Bonus: Make a graph of what you find

skills needed to take accurate heart rates? Did they have a plan for how to record data in an organized way (data table).

Curricular Competencies addressed

- Observe, measure, and record data (qualitative and quantitative) using equipment, including digital technologies.
- Ensure that safety and ethical guidelines are followed in their investigations
- Experience and interpret
- Seek patterns and connections in data from their own investigations and secondary sources
- Use scientific understandings to identify relationships and draw conclusions

Extension

Collect all the data into one data table. Discuss why different groups got the same/different results?

What are students wondering now? What could all this data mean? How is it relevant to their daily lives? How might scientists like themselves, use this data to promote healthy lifestyles?

Curricular Competencies addressed

- Reflect on their investigation methods, including the adequacy of controls on variables (dependent and independent) and the quality of the data collected
- Identify possible sources of error and suggest improvements to their investigation methods
- Consider social, ethical, and environmental implications of the findings from their own and others' investigations
- Contribute to care for self, others, community, and world through personal or collaborative approaches