

Candidate's name: Gabby Lombardo

Grade/Class/Subject:	Grade 5 ADST	School:	Veritas
Date:	March 7, 2023	Allotted Time:	2:00 - 2:55
Topic/Title:	Introduction to Rube Goldberg Machines		

1. LESSON ORIENTATION

Key resources: [Instructional Design Map](#)

Briefly, describe purpose of lesson, and anything else to note about the context of lesson, students, or class, e.g. emergent learning needs being met at this time, elements of focus or emphasis, special occasions or school events.

Students will be introduced to simple machines through a Rube Goldberg Machine. This subject will be completed in stages to allow for design, prototyping and testing their creations. This lessons emphasis will focus on design and logistics of creating their functioning machine.

2. CORE COMPETENCIES

Key resources: <https://curriculum.gov.bc.ca/competencies>

Core /Sub-Core Competencies (check all that apply):	Describe briefly how you intend to embed Core Competencies in your lesson, or the role that they have in your lesson.
COMMUNICATION – Communicating ✓ COMMUNICATION – Collaborating ✓ THINKING – Creative Thinking ✓ THINKING – Critical Thinking ✓ THINKING – Reflective Thinking ✓ PERSONAL AND SOCIAL – Personal Awareness and Responsibility PERSONAL AND SOCIAL – Positive Personal and Cultural Identity PERSONAL AND SOCIAL – Social Awareness and Responsibility	<ul style="list-style-type: none"> Students will have to communicate their design needs with peers and teacher when describing their plan. Students will also have to give and receive feedback about their design plan and adjust accordingly. Students will collaborate to create a cohesive and functioning machine. Students will have to think creatively about the design, the purpose and each step of their machine while taking into consideration what is required to complete the task. Students will have to reflect about their contribution to this group assignment and think about how their input can effect the overall machine and plan.

3. INDIGENOUS WORLDVIEWS AND PERSPECTIVES

Key resources: First Peoples Principles of Learning (FPPL); [Aboriginal Worldviews and Perspectives in the Classroom](#)

FPPL to be included in this lesson (check all that apply):	How will you embed Indigenous worldviews, perspectives, or FPPL in the lesson?
Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors. Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place). ✓ Learning involves recognizing the consequences of one's actions. Learning involves generational roles and responsibilities. Learning recognizes the role of Indigenous knowledge. Learning is embedded in memory, history, and story. Learning involves patience and time. ✓ Learning requires exploration of one's identity. Learning involves recognizing that some knowledge is sacred and only shared with permission and/or in certain situations.	<ul style="list-style-type: none"> Learning is active and not passive understanding happens as learner and subject interact and shape each other (reflexive) Use inquiry and project-based learning to give students opportunity to learn from each other, and for teacher to learn from students Revisit concepts multiple times, scaffolding learning to deepen understanding

4. BIG IDEAS

Key resources: <https://curriculum.gov.bc.ca/> (choose course under Curriculum, match lesson to one or more Big Ideas)

What are students expected to understand? How is this lesson connected to Big Idea/s or an essential question?

Designs can be improved with prototyping and testing.

5. LEARNING STANDARDS/INTENTIONS

Key resources: <https://curriculum.gov.bc.ca/> (choose course under Curriculum)

Curricular Competencies: <i>What are students expected to do?</i>	Content: <i>What are students expected to learn?</i>
<ul style="list-style-type: none">• Defining: Identify key features or user requirements• Prototyping: Outline a general plan, identifying tools and materials. Construct a first version of the product, making changes to tools, materials, and procedures as needed• Testing: Test the product. Make changes and test again, repeating until satisfied with the product• Sharing: Reflect on their design thinking and processes, and their ability to work effectively both as individuals and collaboratively in a group, including their ability to share and maintain a co-operative work space	Students are expected to learn and apply the understanding of a Rube Goldberg machine focusing on the mechanics and planning to construct their own unique machine.

6. ASSESSMENT PLAN

Key resources: [Instructional Design Map](#) and <https://curriculum.gov.bc.ca/classroom-assessment>

How will students demonstrate their learning or achieve the learning intentions? How will the evidence be documented and shared? Mention any opportunities for feedback, self-assessment, peer assessment and teacher assessment. What tools, structures, or rubrics will you use to assess student learning (e.g. Performance Standard Quick Scale)? Will the assessments be formative, summative, or both?

- Students will be assessed through a variety of methods; their ability to participate with the tasks provided as well as effectively plan their design. Students will be required to submit their design plan along with all supplies necessary for construction. Students will also be assessed on their overall completed Rube Goldberg Machine and if they complied with all requirements.

7. DESIGN CONSIDERATIONS

Key resources: [Instructional Design Map](#)

Make brief notes to indicate how the lesson will meet needs of your students for: differentiation, especially for known exceptionalities, learning differences or barriers, and language abilities; inclusion of diverse needs, interests, cultural safety and relevance; higher order thinking; motivations and specific adaptations or modifications for identified students or behavioural challenges. Mention any other design notes of importance, e.g. cross-curricular connections, organization or management strategies you plan to use, extensions for students that need or want a challenge.

- This lesson will be completed in 2 steps to allow for optimal use of time and strategic planning.
- Teachers will be available for each step to allow for scaffolded support and suggestions during the entire process.
- Students have the opportunity to collaborate together to allow for more inclusion and support throughout the construction and planning.
- Instructions will be modelled, written and communicated orally throughout both lessons.
- Those who have fine motor difficulties can have additional support.

Required preparation: *Mention briefly the resources, material, or technology you need to have ready, or special tasks to do before the lesson starts, e.g. rearrange desks, book a room or equipment.*

- Laptop and Smart Board are required to show videos as well as present all material to the class.
- Miscellaneous items will be collected from around the school to show students for their list of supplies
- Worksheet for students to fill for their design phase.

8. LESSON OUTLINE

Instructional Steps	Student Does/Teacher Does (<i>learning activities to target learning intentions</i>)	Pacing
<p>OPENING: <i>e.g. greeting students, sharing intentions, look back at what was learned, look ahead to what will be learning, use of a hook, motivator, or other introduction to engage students and activate thinking and prior knowledge</i></p>	<ul style="list-style-type: none"> • Start with a video to get students interested in what a Rube Goldberg Machine is https://www.youtube.com/watch?v=qybUFnY7Y8w • Have students discuss what they noticed from the video • Show another shorter simpler video on how to start thinking about building a machine https://www.youtube.com/watch?v=6aFVbjwA_y4 • Stop and stop to discuss the common items used: dominos, foam, pullys, ramps, tunnels, funnels 	<p>5 - 10 minutes</p>
<p>BODY:</p> <ul style="list-style-type: none"> • <i>Best order of activities to maximize learning -- each task moves students towards learning intentions</i> • <i>Students are interacting with new ideas, actively constructing knowledge and understanding, and given opportunities to practice, apply, or share learning, ask questions and get feedback</i> • <i>Teacher uses learning resources and strategic opportunities for guided practice, direct instruction, and/or modelling</i> • <i>Can include: transitions, sample questions, student choices, assessment notes (formative or otherwise), and other applications of design considerations</i> 	<ol style="list-style-type: none"> 1. What is a Rube Goldberg Machine - a series of chain reactions in a simple machine using random assorted items 2. Now that students have an idea of what a Rube Goldberg Machine is the lesson will be slowly introduced. Students are familiar with STEM lessons that they happen in parts 3. Explain that today's lesson is the planning and design phase 4. Students will be tasked with constructing a working Simple Machine 5. Explain to students what the END GOAL is: to construct a Rube Goldberg Machine and have a marble travel from a start point to end 6. The machine has to have at least 5 chain reactions 7. Provide students a list of items they will have access to 8. Go over logistics of how they can create a simple machine chain reaction 9. Video: stopping, discussing and explaining each step 10. Students can have the option to work in pairs or in 3s similar to the Chariot Race 11. Today is a design day. No supplies will be distributed, used or touched. The purpose is to plan in detail the goal, the look and list all supplies needed to complete the task 12. Teacher will show them the supplies available so they have a full scope of what the items look like and how they can be manipulated. 13. Allow students to break apart to start their planning and design. 14. Circulate the room and periodically check in with each group to allow for feedback and questions. 	<p>45 minutes</p>

<p>CLOSING:</p> <ul style="list-style-type: none"> • <i>Closure tasks or plans to gather, solidify, deepen or reflect on the learning</i> • <i>review or summary if applicable</i> • <i>anticipate what's next in learning</i> • <i>"housekeeping" items (e.g. due dates, next day requirements)</i> 	<ul style="list-style-type: none"> • Give students a 5 minute warning when the lesson is close to the end and remind students what is required to be handed in. • Students will have to provide a full breakdown of what they need, who they are working with and what they want to achieve. • Collect student draft sheets. • Get students ready for end of day routine. 	<p>5 minutes</p>
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Construction Items available for students:

Wood blocks and manipulative, base 100 and 1000s blocks, popsicle sticks, straws, wood sticks, clothes pins, yarn, toilet paper rolls, dominos, lego, wheels, CDs, foam noodles, pipe cleaners, rubber bands, tape, Knex construction, card stock, construction paper, binder coils, paper cups, paper cones, marbles

*students also have access to hot glue under teacher supervision

Group Members: _____

Rube Goldberg Machine Design Form

Supplies Needed:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

What are the 5 Chain Reactions that will happen in your machine?

1. _____
2. _____
3. _____
4. _____
5. _____