

OUR TOWN: AN INTEGRATED UNIT EXPLORING MEASUREMENT, ELECTRICITY AND DESIGN

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Classroom Catalyst : Our Town

Title: Our Town: An Integrated Unit Exploring Measurement, Electricity and Design

Grade Level: 6

Strand(s) and Unit(s):

Science--Electricity

- Electrical energy can be transformed into other forms of energy
- Follow established safety procedures for working with electricity and building tools
- design and build series and parallel circuits, draw labelled diagrams identifying the components used in each, and describe the role of each component in the circuit
- use technological problem-solving skills to design, build, and test a device that transforms electrical energy into another form of energy in order to perform a function and to create a 3 dimensional structure for Our Town

Math--Measurement

- solve problems requiring conversion from larger to smaller metric units
- determine, through investigation using a variety of tools and strategies the relationship between the area of a rectangle and the areas of parallelograms and triangles
- determine, through investigation using a variety of tools and strategies, the surface area of rectangular and triangular prisms

Overview:

Inquiry Focus: How can we plan and build a structure for Our Town that has the base area of 100 units square and incorporates one or more electrical component?

Timeline: The unit took 4 to 5 weeks

Prior Knowledge:

1. How to work in groups using the TRIBES cornerstones--Right to pass/Right to Participate, Mutual Respect, Appreciation/No Put Downs, Attentive Listening. The year was built on group work and problem solving in Math and Science.

2. The three classes were also involved in our school D.I.C.E. inquiry which built up curiosity, independence and grit. DICE is a maker oriented school project that gave students skills and experience in technology, building, and communicating.
3. Lessons and activities were provided in electrical circuits (parallel and series, making a homemade switch, safety in using building tools, measuring and cutting, troubleshooting for electrical problems, using conductive tape, making “bristle bots”, using solar panels and stripping wire)
4. Students learned “on the job” as they needed to work out how to make things like pulleys, touch sensitive switches, designing and building a car/ambulance)
5. How to draw a thumbnail sketch and then a more detailed design drawing of what you want to build (this was covered in our Rocket Launch design and build for Flight)

Big Ideas: From the Capacity Building Series: Getting Started with Inquiry

...”students find and use a variety of sources of information and ideas (through mathematics, science, and DICE) to increase their understanding (of how they might build their structure/device). This involves investigation, exploration, search, quest, research, pursuit and study. It is enhanced by involvement with a community of learners, each learning from the other in social interaction”

From the Curriculum

1. to develop the skills, strategies, and habits of mind required for scientific inquiry and technological problem solving
2. help students to integrate scientific and technological knowledge with knowledge in other subject areas, such as mathematics (surface area, volume, base area) and social studies (what are the key components of a town and where should they be located).
3. Electrical energy can be transformed into other forms of energy.

Key Concepts:

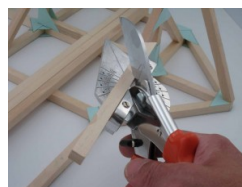
1. Making and revising plans
2. Applying concepts about electricity and measurement to the building
3. Persevering with challenges
4. Working as a team

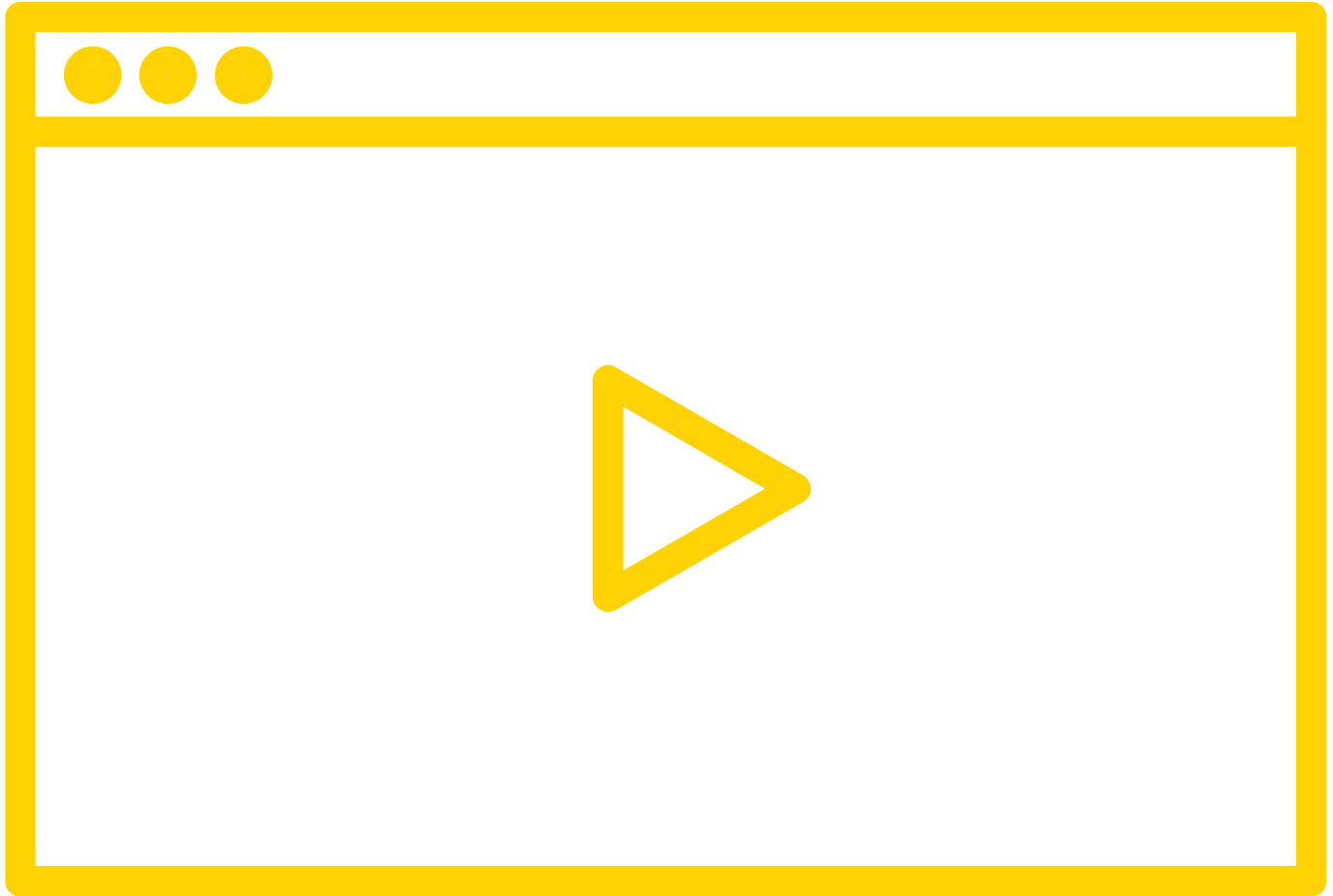
Materials and Equipment:

Electricity materials: wires, wire stripper, electrical tape, brass fasteners, paper clips, cardboard (for the switch) bulbs, batteries, battery holders, buzzers, conductive tape, materials for bristle bots, cardboard, solar panels, grid paper, exacto knives, motors, various sizes of wooden pieces etc.

Safety:

1. Exacto knives: demonstrate how to cut, have a station or 2 that will be just for cutting, students need to measure and draw cut lines before using knives--NO FREE HAND CUTTING!
2. Hot Glue guns: also at a separate centre with a board underneath. Students use gardening gloves when gluing to prevent burns
3. Cutting using Mitre Cutter: Mini lesson of how to cut wooden pieces








**WATCH THE VIDEO**

00:57 min

([//www.youtube.com/embed/6MRAr0DTwLA?width=800&height=450&iframe=true](https://www.youtube.com/embed/6MRAr0DTwLA?width=800&height=450&iframe=true))

RESOURCES

-  Video of all the fun (<https://www.youtube.com/watch>)
-  The Google Slide Show of Our Town (https://docs.google.com/a/pdsb.net/presentation/d/19R3dnQVvgDRQqG_ejJek11WuCv4N4xnTr212FH62Bl8/edit)
-  pics of us working (https://connex.stao.ca/sites/default/files/images/img_0361.jpg?width=1400px&height=1867px&iframe=true)
-  Design Rubric to guide your learning (https://connex.stao.ca/sites/default/files/final_design_project_rubric2.docx)
-  Work book for Our Town (https://connex.stao.ca/sites/default/files/math_and_science_unit_workbook_for_our_town_1.pdf)

ELEMENT


-  Inquiry (</expert-elements/inquiry>)




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