Pictou County Forest School - Grade 5 Lesson Plans
Physical Science: Forces and Simple Machines

Activity: Mission: Marshmallows!! (suggested time 90 - 120 minutes)
Overall Curriculum Outcome: Learners will construct effective simple and compound machines.
Specific Curriculum connections:
Simple and compound machines used in daily life
- How can a simple machine help us to do work?

Types of forces in simple machines
- How do simple machines transfer force?

Constructing simple and compound machines
- How can I construct simple machines?
- How can I combine several simple machines to solve a complex task?

Machine effectiveness
- How can the effectiveness of a machine be tested?
- How can the effectiveness of a machine be improved?

Materials:
- Loose parts: rope, dowels, wedges, pulleys
- Tools: saws, hammers, nails, drills, screws, scissors
- Glue, paper,
- Found natural materials
- simple/compound machine infographic

This is an inquiry activity, focussing on the idea of learning as a process. Students learn new skills and ideas in real time in response to real, meaningful necessity (intrinsic motivation).[1]

Scenario:
Take the group of students over to the little brook that runs between the two fields near Base Camp 2.0.

Students are on one side of the brook. Place marshmallows on the other side of the brook.
- In groups students need to build a machine to get the marshmallows over the brook. If successful, marshmallow buffet ensues.

Instructions
- Provide students with relevant materials
- Support students' inquiry with 'just in time' teaching, helping kids safely use saws, drills etc.

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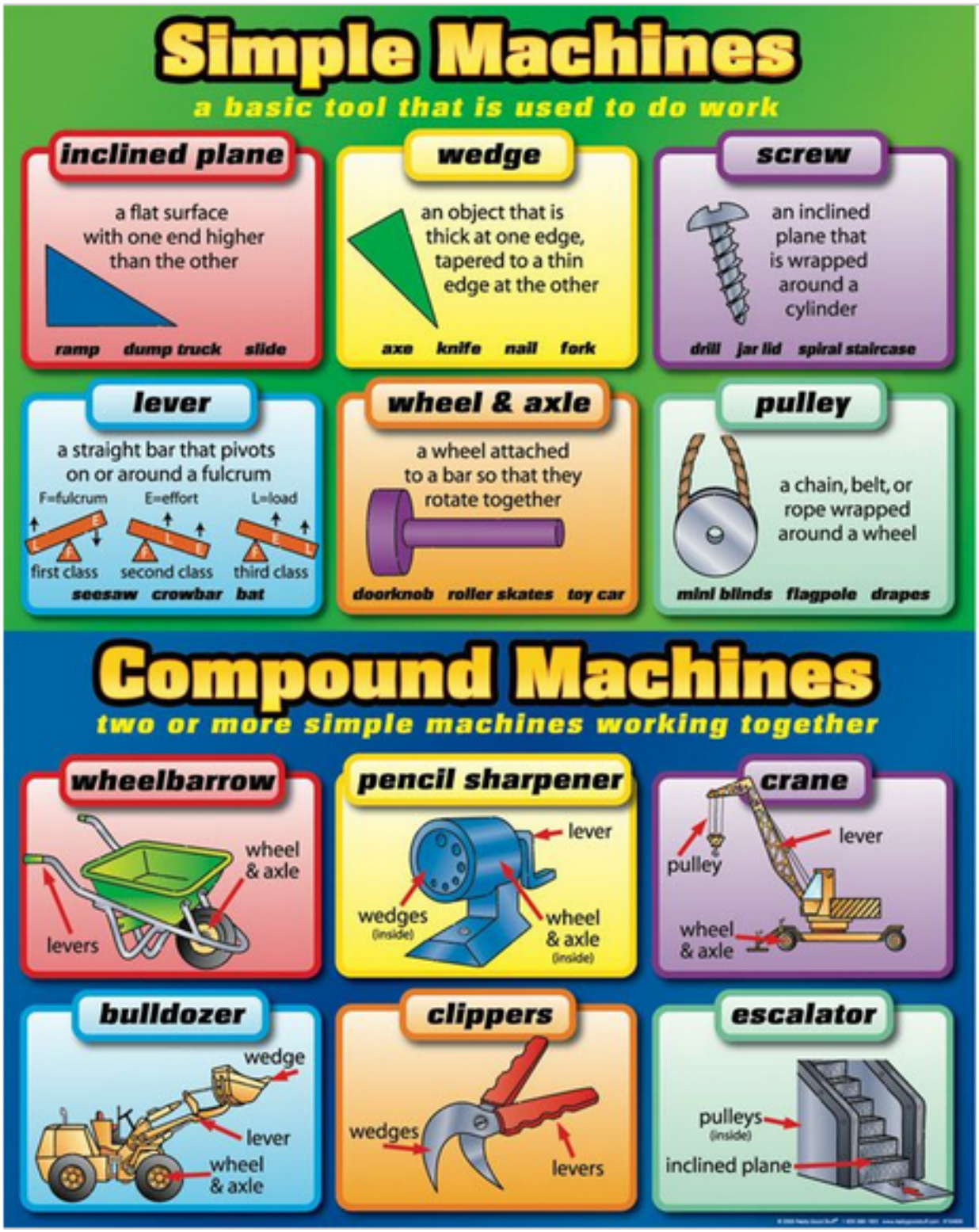
[1] The Limits of Instruction: "Constructionist research has demonstrated the benefits to students engaged in active learning by doing. The existing literature stresses the importance of a project approach as a precursor to instructional practices or as an ancillary activity to instruction. My work suggests that the project should be an educator's smallest unit of concern and may replace instruction entirely, with better results. This research may also seek to define the limited efficacy of instruction." http://professorgarystager.com/research-interests


Simple Machines
a basic tool that is used to do work
inclined plane
a flat surface with one end higher than the other
ramp dump truck slide
wedge
an object that is thick at one edge, tapered to a thin edge at the other
axe knife nail fork
screw
an inclined plane that is wrapped around a cylinder
drill jar lid spiral staircase
lever
a straight bar that pivots on or around a fulcrum
F=fulcrum E=effort L=load
first class second class third class
seesaw crowbar bat
wheel & axle
a wheel attached to a bar so that they rotate together
doorknob roller skates toy car
pulley
a chain, belt, or rope wrapped around a wheel
mini blinds flagpole drapes
Compound Machines
two or more simple machines working together
wheelbarrow
wheel & axle
levers
pencil sharpener
lever
wedges (inside)
wheel & axle (inside)
crane
pulley
lever
wheel & axle
bulldozer
wedge
lever
wheel & axle
clippers
wedges
levers
escalator
pulleys (inside)
inclined plane