

“TRIGGERS OF CHANGE”

Essential Question: What activities will allow third graders to become thinkers, problem-solvers, and visionaries for the future?

Sub-Questions:

- What activities will help third graders to understand the cause-and-effect that happens in real life?
 - ⇒ To consider the “triggers of change” in communities: past, present, and future (How communities grow and change)
 - ⇒ To look at current problems in our world and consider what caused them, and how they might be solved (cause-effect, problem-solving)
 - ⇒ To consider what effect current triggers (inventions, discoveries, actions) may have on the future (and if the effect is a problem, to consider possible solutions)

- What activities will help third graders to “compare and contrast” the communities of the past, present, and future?
 - ⇒ To consider the basics of what a community needs to exist (minimal technology). Look at what technology was used by the early civilizations of the Egyptians, Vikings, and the Maya/Aztecs, and/or the pioneers of Colonial times, and compare to what our life is like today.
 - ⇒ To consider where, why, and how communities develop (and how we know about early communities through artifacts)
 - ⇒ To use the “triggers of change” in the past to help predict what today may become a “trigger of change” for the future (look at the past and see the future)
 - ⇒ To envision how a future community might develop on a Mars colony, or in a space station. (Would early life on a Mars colony be more like the Pioneer life in Colonial times if electricity was not available?) Compare the technology used in the future on Mars (or on a Space Station) with what we use today, or what was used in the past.

GOAL (DESIRED RESULT)	ASSESSMENT (ACCEPTABLE EVIDENCE)	ACTIVITIES (HOW TO ACHIEVE DESIRED RESULT)	
<p>To introduce the concept of “cause and effect” by demonstrating that every action has a reaction.</p> <p>(For something to “cause” change, to have an “effect,” there has to be a BEFORE and an AFTER.)</p>	Students demonstrate that...	A.	
	<ul style="list-style-type: none"> When matter is heated, its particles move faster and the state of matter (solid, liquid, gas) may change. 	Using an ice cube or snowball, and a pan of water, students watch the water take new forms after melting and evaporating. (for heat, use heater in classroom?)	
	<ul style="list-style-type: none"> When matter is broken up into smaller pieces, there is a physical change (It looks different). 	Students cut up different types of matter (i.e. paper, grass, rubber bands, etc.) and observe that the material stays the same even though its shape looks different. B.	
	<ul style="list-style-type: none"> When two types of matter are mixed together, they may stay separate, or they may mix but not irreversibly, or they may undergo a chemical change to a different type of matter. 	Students run experiments of mixing different ingredients together, and observe if the change is reversible or not. (i.e. make Blobber or Oobleck) D.	
	<ul style="list-style-type: none"> When matter is heated, there may be a chemical change resulting in a new kind of matter. 	Students watch what happens when something that needs to be kept cold (i.e. milk) is kept at room temperature (changes to sour milk). C.	
	<ul style="list-style-type: none"> When force (i.e. gravity, friction) is applied, the object moves and/or changes direction. 	<i>Discovery Works unit C:</i> Activities C46, C60-61, C62-63: Experiments that show the effect of friction and gravity on the movement of objects. E.	
	<ul style="list-style-type: none"> A simple machine (lever, fulcrum, inclined plane, wheel and axle, pulley) changes the size or direction of a force. <p>Another resource for activities: <i>Gizmos & Gadgets: Creating Science Contraptions that Work (& Knowing Why)</i></p>	<i>Discovery Works unit C:</i> Activities C68-69, C70-71 F. <i>Science Around the World:</i> p. 3-7 Demonstration of how force, friction, and simple machines were used to help make the pyramids in Egypt. G. <i>Pyramids! 50 Hands-On Activities to Experience Ancient Egypt:</i> Make a Sledge (p. 42) H. <i>Technology in the Time of the Vikings:</i> Make a Viking Ship (p. 19) I.	
	CHARACTER	<ul style="list-style-type: none"> Every choice has a consequence. 	Students make a diagram (family tree style) that details how different paths, based on different choices, can branch out from one starting point. J. Students read a story to the point where a character makes a choice, and then write their own ending based on the character making a different choice. K.
	LITERATURE	<ul style="list-style-type: none"> Events in a story (i.e. the actions of a trickster) may cause someone or something to change. 	Students read a pourquoi or trickster story, fill out a cause/effect graphic organizer, and write a one-paragraph analysis of cause/effect in the story. L.
	MATH	<ul style="list-style-type: none"> When we find out how many people are eating, we can change the recipe so that it makes enough for everyone. 	Students problem-solve how to change a recipe to have an increased number of servings that will feed a certain amount of people. M. Students (in small groups) prepare a recipe for whole class. N.
		<ul style="list-style-type: none"> When a number is added to, taken away from, multiplied, or divided into parts, the number changes. (problem-solving) 	Students create their own story problems that demonstrate how the action in the story causes the number to change. O.

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To consider the “triggers of change” in communities: past, present, and future (How communities grow and change)	<p style="text-align: center;">SOCIAL STUDIES</p> <p>By writing a report about the effect that new technology has on one’s life, students demonstrate an understanding of “cause and effect” in real life.</p> <p>If students are able to “experience” the technology from long ago, their comprehension of “change over time” will be increased by “doing.”</p> <p>How the student answers the T.A.G. questions demonstrates level of comprehension and reflection.</p>	<p>Students use a modified T.A.G. (Technology Assessment Guide) to think about a specific type of technology: What was life in a community like before and after this piece of technology was introduced? Did the technology solve any problems? Did it create or cause any new problems or needs? In other words, what effect did the technology have on life in the community?</p> <p>Students research a piece of technology, take notes on a Main Idea/Detail graphic organizer, and write a one-paragraph report about how the technology changed (had an effect on) life in a community (prove a change from BEFORE the technology to AFTER). ^{R.}</p> <p>Depending on the technology, students may give a demonstration of how it is used.</p> <ul style="list-style-type: none"> • SOCIAL STUDIES book p. 188 – 195: Transcontinental Railroad, Telegraph and Telephone, Lightbulb, Radio and Television, Automobile and Airplane, Satellite ^{P.} • SCIENCE book p. C66-67 (wheel) ^{Q.} • <i>Technology in the Time of Ancient Egypt</i> (plow, irrigation canal, loom, clock, calendar, potter’s wheel, writing pens and paper...) • <i>Technology in the Time of the Vikings</i> (plow, underground or clay ovens, rotary quern, Viking ships, the Oseberg sled, the Oseberg wagon, skates, Ironsmith tools, loom...) • <i>Secrets in Stone: All About Maya Hieroglyphs</i>: (zero and a number system, writing system – hieroglyphics, rubber ball) • Other ideas: telescope, microscope, computer, sewing machine, printing press...
To look at current problems in our world and consider what caused them, and how they might be solved (cause-effect, problem-solving)	<p style="text-align: center;">SOCIAL STUDIES</p> <p>Rubrics for the graphic organizers assess the students’ ability to discern the actions that cause a problem, and what actions can help solve the problem.</p>	<p>Using SOCIAL STUDIES book p. 176 – 181 (lesson 4: problem of pollution in Mexico City): ^{S.}</p> <ul style="list-style-type: none"> • Students complete a cause/effect graphic organizer to show what caused the pollution. • Students complete a problem/solution graphic organizer to show what the city has done to help solve the problem of technology. • Students write one paragraph from each graphic organizer to create a 2-paragraph report. • Students draw “before” and “after” pictures of a town square with and without pollution.

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	<p>Level of thinking and comprehension assessed by the ideas and connections that the student expresses orally or in writing (for individual work).</p> <p>For group work: Students must present evidence of a contribution to the group (i.e. each student has a role to perform). Individual assessment by having students individually fill out a reflection sheet after their presentation or report.</p>		<p>Extension: Students (individual or cooperative group) present an opinion (written or oral) about the cause and effects of space junk: T.</p> <ul style="list-style-type: none"> • What is the cause of 6,209 pieces of “space junk” currently orbiting the earth? • How might the “space junk” affect us in the future? • What are some possible solutions to this problem?
<p>To consider what effect current triggers (inventions, discoveries, actions) may have on the future (and if the effect is a problem, to consider possible solutions)</p>	SOCIAL STUDIES/SCIENCE	<p>Rubrics for the graphic organizers assess the students’ ability to discern the actions that cause a problem, and what actions can help solve the problem.</p> <p>The “AFTER” on the cause/effect graphic organizer, and the EVENTS and SOLUTION on the problem/solution graphic organizer demonstrate the students ability to be a thinker, problem-solver, and visionary for the future.</p>	<p>Example: U.</p> <ol style="list-style-type: none"> 1. Students fill out a cause/effect graphic organizer: <ul style="list-style-type: none"> ⇒ WHAT: Arctic Circle ⇒ BEFORE: Describe what it is like, arctic animals live there, etc. ⇒ CAUSE of change: Drilling for Oil ⇒ AFTER: Hypothesize or predict what might happen as a result of drilling – i.e. arctic animals die 2. Students fill out a problem/solution graphic organizer where the problem is the effect (the AFTER) from the cause/effect graphic organizer: <ul style="list-style-type: none"> ⇒ PROBLEM: i.e. Drilling for oil ruined the home for many arctic animals. ⇒ EVENTS: Student must problem-solve – consider some steps that might help solve the problem (no right or wrong answer) ⇒ SOLUTION: What does the student envision as the solution to this problem? How would the student like to see it end up? (opinion) 3. Students turn each graphic organizer into a paragraph of a 2-paragraph op-ed report. <p>Other possible topics:</p> <ul style="list-style-type: none"> • People produce more and more trash, and the Earth runs out of room for landfills or dumps. (solution: recycling) • The earth runs out of oil. (solution: alternative sources of energy) • Most of the rainforests are destroyed causing the Greenhouse Effect (less rain in the world, more dry, more deserts, less trees, less oxygen in the air)
	LITERATURE	<p>Reading or Listening comprehension is assessed by the ideas expressed orally by the students. Does what one person say serve as a springboard for others, so that they think of something based on what someone else just said? Do they take risks?</p>	<p>Read <u>Just a Dream</u> by Chris Van Allsburg V.</p> <p>Fill out graphic organizer (student choice for type)</p> <p>Students discuss story in a Socratic Seminar.</p>

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	SCIENCE	<p>Does student understand how his/her invention works?</p> <p>Does student use his/her imagination to consider how his/her invention could be helpful to others, or how it could result in a new need or problem? Does student put effort into problem-solving the effect his/her invention may have?</p> <p>What does the student's attitude about his/her invention seem to be? Does the work appear to have been done as neatly as possible?</p>	<p>Invention Convention.</p> <p>Students (individually or with a partner) come up with an invention.</p> <p>In addition to describing how their invention works, and how it could be helpful to people (a positive effect), students think about whether their invention could result in a new need or problem, and how that could be solved. (oral or written)</p>