



## Summary

### How The World Works - Structure Promotes Function

Subject

Science Lab, Social Studies

Year

Fourth Grade

Start date

Week 4, March

Duration

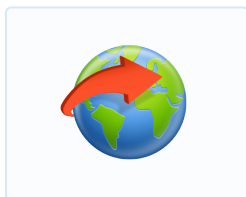
4 weeks



## Inquiry



### Transdisciplinary Theme



How the world works



### The Central Idea

Structure promotes function



### Lines of Inquiry

- An inquiry into how society and the environment function
- An inquiry into how barriers in structure hinder function
- An inquiry into how balance affects function



### Teacher questions

- Function – How do the new inventions work?
- Change - How did the new inventions change life, production, and communication?
- Connection – What impact did the new technology have on society and economics?
- Connection – How did the new technology impact world trade?



## Learning Goals



### Standards and benchmarks

Georgia State Standards

GSE: Science (2016)

#### Physical Science Grade 4

S4P3. Obtain, evaluate, and communicate information about the relationship between balanced and unbalanced forces.

- Plan and carry out an investigation on the effects of balanced and unbalanced forces on an object and communicate the results.



- b. Construct an argument to support the claim that gravitational force affects the motion of an object.
- c. Ask questions to identify and explain the uses of simple machines (lever, pulley, wedge, inclined plane, wheel and axle, and screw) and how forces are changed when simple machines are used to complete tasks.

GSE: Social Studies (2016)

#### Historical Understandings Grade 4

SS4H5 Explain the causes, major events, and consequences of the Civil War.

- a. Identify Uncle Tom's Cabin and John Brown's raid on Harper's Ferry and explain how each of these events was related to the Civil War.
- b. Discuss how the issues of states' rights and slavery increased tensions between the North and South.
- c. Identify major battles, campaigns, and events: Fort Sumter, Gettysburg, the Atlanta Campaign, Sherman's March to the Sea, and Appomattox Court House.
- d. Describe the roles of Abraham Lincoln, Robert E. Lee, Ulysses S. Grant, Jefferson Davis, Thomas "Stonewall" Jackson, and William T. Sherman.
- e. Describe the effects of war on the North and South.

SS4H6 Analyze the effects of Reconstruction on American life.

- a. Describe the purpose of the 13th, 14th, and 15th Amendments.
- b. Explain the work of the Bureau of Refugees, Freedmen, and Abandoned Lands (Freedmen's Bureau).
- c. Explain how slavery was replaced by sharecropping and how freed African Americans or Blacks were prevented from exercising their newly won rights.
- d. Describe the effects of Jim Crow laws and practices.



### Key and Related Concepts



#### Key Concepts

Key Concepts

Key questions and definition



Function

#### How does it work?

The understanding that everything has a purpose, a role or a way of behaving that can be investigated.



Causation

#### Why is it as it is?

The understanding that things do not just happen; there are causal relationships at work, and that actions have consequences.



Change

#### How is it transforming?

The understanding that change is the process of movement from one state to another. It is universal and inevitable.



## Developing IB Learners

### ★ Learner Profile



Inquirers



Knowledgeable



Communicators

#### Description

Acquisition of knowledge, Analysis, Evaluation, and Dialectical thought



## ATL Skills



### Approaches to Learning

#### Description

Acquisition of knowledge, Analysis, Evaluation, and Dialectical thought



### Communication Skills

- Exchanging information - Listening, interpreting and speaking

#### Listening

Listen to, and follow the information and directions of others.

Listen actively to other perspectives and ideas.

Ask for clarifications.

Listen actively and respectfully while others speak.

#### Speaking

Speak and express ideas clearly and logically in small and large groups.

Give and receive meaningful feedback and feedforward.

State opinions clearly, logically and respectfully.

Discuss and negotiate ideas and knowledge with peers and teachers.

Communicate with peers, experts and members of the learning community using a variety of digital environments and media.

- Literacy - Reading, writing and using language to gather and communicate information

#### Reading

Read critically and for comprehension.

#### Writing



Use appropriate forms of writing for different purposes and audiences.

Paraphrase accurately and concisely.

Record information and observations by hand and through digital technologies.

Use a variety of scaffolding for writing tasks.

Organize information logically.

Make summary notes.

Communicate using a range of technologies and media.

Understand and use mathematical notation and other symbols.

Responsibly participate in, and contribute to, digital social media networks.



Self-management Skills



## Action

### Student-initiated Action

Students were engaged in online learning and were unable to complete this planner in its entirety due to COVID 19.



## Assessment & Resources

### Ongoing Assessment

What are the possible ways of assessing students' understanding of the central idea? What evidence, including student-initiated actions, will we look for?

- Industrial Revolution Crossword

HAVE STUDENTS RESEARCH THE CONSTITUTION

HAVE STUDENTS CREATE DIAGRAM OF AN INVENTION – INCLUDING ILLUSTRATIONS AND LABELS

STUDENTS WILL WRITE AND ILLUSTRATE AN ADVERTISEMENT FOR THEIR INVENTION

STUDENT SELF-ASSESSMENT

What are the possible ways of assessing students' prior knowledge and skills? What evidence will we look for?

Cooperative groups to determine impact of technology on society



Cotton workers journal entries

Reaper trifold

MS Word "steaming fun facts"

Clothing research

Morse Code message of facts

D.A.R.E. student reflection journal

## Learning Experiences

### Designing engaging Learning Experiences

#### Gifted and enrichment activities:

 4 [How the World Works](#) Apr 21, 2022

1. Eli Whitney's Cotton Gin: Write journal entries from cotton workers point of view
2. McCormick Reaper: Use tri-fold for "hand-powered, horse-powered, and machine powered / use a word web to explore all things we use that are made of wheat
3. Power of steam: Internet research with clip art and facts including the steam locomotive, steam engine, and steamboat
4. Spinning Jenny and clothing production: Use questionnaire from research – read and highlight important information
5. Telegraphic Communication: Research facts and convert to Morse Code <http://www.zianet.com/sparks/coder.html>
6. Yahoo!igans Federal government patent process research – read a flow chart

#### Music

Key Concepts: Form, Function, Causation

- Explore movements inspired by simple machines
- Create a movement dance inspired by simple machines
- Analyze a movement dance inspired by simple machines

#### Science Lab:

Key Concepts: Form, Function Causation

Activities:

- Students will view the teacher pulling a table cloth off a table without disturbing the items on the cloth (or view Steve Spanglar Science), play tug-of-war with a string (balanced/unbalanced forces), observe and try the egg drop into glass of



water activity, then experiment with FOSS balanced/unbalanced pieces, and finally view Generation Genius video about balanced and unbalanced forces. Students will use these experiences to communicate results and to formulate and argument to support the claim that gravitational forces affects the motion of an object, using CSQ (Claim Support Question) format.

- Students will prove how forces change when simple machines are used to complete tasks, by utilizing various simple machine parts to create a "simple-machine" museum and demonstration.
- Students will culminate knowledge of forces, motion, and simple machines to complete the Rube Goldberg Design Challenge where the create a Rube Goldberg machine with at least 3 simple machines then record on Flipgrid.

Spanish -

Students will recognize vocabulary associated with simple machines

Gifted:

- GRASPS

• GOAL:	• Your goal is to identify a problem that can be solved using simple machines and then create an invention that solves that problem.
◦ ROLE:	• You are an inventor.
◦ AUDIENCE:	• The audience is the other Invention Convention participants and conventioners. •
◦ SITUATION:	• You have identified a problem that needs to be solved by using simple machines You need to create an original invention that solves that problem using simple machines.
◦ PRODUCT:	• You will create the actual invention, make a model of the invention or draw an illustration to submit for a patent. You will include a paper that explains what materials you used, the problem that the invention solves and the form(s) of energy that you used. (This can be a video commercial or a written paper.) You will then share your invention orally with the Invention Convention attendees.
◦ STANDARD:	<ul style="list-style-type: none"> <li>• <b>Advanced Communications Skills (ACS)</b></li> <li>• ACS 1. Selects appropriate method(s) of communication considering purpose, audience, format, and content.</li> <li>• 2. Utilizes technology to collaborate and create products which inform, entertain, or persuade others. Makes connections across disciplines to generate original and complex ideas and products.</li> <li>• 5. Communicates orally with focus, energy, and passion in various formats (speeches, debates, interviews, etc.) in order to engage and influence the audience</li> <li>• 6. Communicates effectively in writing by taking into consideration purpose and audience to persuade or defend an argument.</li> <li>• 7. Communicates through visual products and performances which are creative and innovative and engage the audience with consideration to aesthetics and purpose.</li> <li>•</li> </ul>



- **Creative Thinking & Problem Solving (CPS) Elements**
- 1. Critiques environment and uses evidence as basis to identify a problem.
- 2. Uses multiple sources including knowledge, personal conjectures, and assumptions to begin collecting data. Develop generalizations.
- 5. Develops ideas using independent conjecture and novel concepts without concerns for accuracy.
- 8. Tolerates ambiguity when solving problems.
- 9. Posses the ability to synthesize ideas with the ability to enhance preexisting ideas and concepts by rearranging, revising, and reconstructing.
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- **Higher Order Thinking Skills (HOTS)**
- 1. Asks probing, insightful, and relevant questions. Models thinking skills, examples of applied thinking, and adaptive response.
- 3. Identifies, creates, and engages in learning- linked to prior knowledge or experience- which extends lower order skills- discriminations, application, and analysis.
- 5. Refines decisions, performances, and products within the context of available knowledge and experience
- 6. Exercises and extends critical, logical, reflective, and creative thinking when encountering increasingly complex questions, uncertainties, or dilemmas.
- 8. Engages in peer discussions and cooperative learning while accepting challenging tasks and critical feedback from peers.
- 10. Draws conclusions based upon relevant information while discarding irrelevant information
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## Stream & Resources

### Resources



**Note** posted on Aug 15, 2019 at 9:49 AM

<http://www.zianet.com/sparks/coder.html>

S. St. textbook

[www.howstuffworks.com](http://www.howstuffworks.com)

Videos – “L. Latimer”, “Invention of the Bicycle”, Schlessinger – “Industrialization and Urbanization”

[www.americaslibrary.org](http://www.americaslibrary.org)

primary and secondary sources

media center research