# Constructive and Destructive Forces-GT Differentiated Exemplar Lesson

<table>
<thead>
<tr>
<th>Grade Level: 3rd</th>
<th>Subject Area(s):</th>
<th>Science TEKS/Student Expectations:</th>
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<tbody>
<tr>
<td>Title: Landforms/Earth Changes/Tectonics</td>
<td>___ Reading, Writing, ___ Mathematics ___ Social Studies</td>
<td>3.7: Earth and space. The student knows that Earth consists of natural resources and its surface is constantly changing. 3.7C: identify and compare different landforms, including mountains, hills, valleys, and plains.</td>
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**Essential Question(s):**
1. How do forces shape Earth’s land?
2. How are constructive and destructive forces similar and how are they different?
3. What effects do constructive and destructive forces have on landforms and what types of landforms do they create?
4. What evidence can be found that the Earth has changed over time?
5. Why are constructive forces so destructive?

**Assessment(s):**
___ Pre-Assessment ___ Formative ___ Summative

**GT Scope and Sequence Skills:**
(Aligned with 21st Century Skills Framework & College and Career Readiness Standards)
___ Auditory ___ Visual/Spatial ___ Kinesthetic ___ Other

**Student Learning Styles:**
___ Auditory ___ Visual/Spatial ___ Kinesthetic ___ Other

**Elements of Depth and Complexity:**
___ Ethical Considerations ___ Unanswered Questions ___ Over Time ___ Different Perspectives ___ Big Ideas

## Lessons and Activities

___ Whole Class ___ Small Group ___ Independent

**PART ONE:**
**Whole Class:**
Students are studying volcanoes (a constructive/destructive force) and other landforms.

**Resources:**
- [http://www.geology.sdsu.edu/how_volcanoes_work/Calderas.html](http://www.geology.sdsu.edu/how_volcanoes_work/Calderas.html)
**GT Level Group:**

Students will investigate and identify unusual constructive and destructive forces. Students will research and analyze information to determine if the following landforms are constructive and destructive forces:

- calderas,
- geysers,
- tsunamis,
- moraines,
- hurricanes

Students will discuss the characteristics of destructive and constructive natural forces.

Students will research the following constructive and destructive forces:

- calderas,
- geysers,
- tsunamis,
- moraines,
- hurricanes

Students will then construct a poster explaining:

- **What** is a constructive and destructive force?
- **What** is a calderas, geysers, tsunamis, moraines, hurricanes?
- **How** are calderas, geysers, tsunamis, moraines, hurricanes occur?
- **Where** do calderas, geysers, tsunamis, moraines, hurricanes occur?
- **Why** are calderas, geysers, tsunamis, moraines, hurricanes considered destructive or constructive forces?

Students will draw or retrieve pictures from the Internet of calderas, geysers, tsunamis, moraines, and hurricanes

Students will then present their findings to the class.

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http://www.moorlandschool.co.uk/earth/rockcycle.htm
Dynamic Earth—rock cycle, weathering, erosion, etc.

http://volcanoes.usgs.gov/yvo/
Yellowstone Volcano Observatory

http://www.discoveryeducation.com/teacherfeature/011705volcano/feature.cfm
Discovery Education—volcanoes

http://www.pbs.org/wnet/savageearth/index.html
Savage Earth—Animated images of earthquakes, volcanoes, and tsunamis

http://volcano.und.nodak.edu/vwdocs/kids/kids.html
volcanoes.

http://www.discoveryeducation.com/teacherfeature/040405yellowstone/feature.cfm
Discovery Education—Yellowstone National Park sits on top of one of Earth's largest volcanoes — a "supervolcano." Explore this geologically active area that offers a wealth of natural and scientific resources.

http://earthquake.usgs.gov/
USGS Earthquake Hazards Program

http://visibleearth.nasa.gov/
Visible Earth

http://kids.earth.nasa.gov/archive/pangaea/quiz.html
Continental Drift Interactive Quiz NASA

This Dynamic Earth: the Story of Plate Tectonics
**Process Assessment**
Teacher observes the following:

<table>
<thead>
<tr>
<th>Process Observation - Frequency</th>
<th></th>
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<tbody>
<tr>
<td>Student uses correct terminology such as <strong>DESTRUCTIVE AND CONSTRUCTIVE FORCES</strong> during interactions with peers and teacher.</td>
<td></td>
</tr>
<tr>
<td>Seldom/Never</td>
<td>Occasionally</td>
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<tr>
<th>Process Observation – Quality of Creative Thinking</th>
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<tr>
<td>Student uses creativity throughout the stages of the task when researching.</td>
<td></td>
</tr>
<tr>
<td>Typical of Peers</td>
<td>Fluent Thinker</td>
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<tr>
<th>Process Observation – Quality of Analytical Thinking</th>
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<tr>
<td>Student analyzes information during the task.</td>
<td></td>
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<tr>
<td>Typical of Peers</td>
<td>Fluent Thinker</td>
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<th>Process Observation – Quality of Application of Information</th>
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<tr>
<td>Student applies learned information during the task.</td>
<td></td>
</tr>
<tr>
<td>Typical of Peers</td>
<td>Fluent Application with some supporting evidence</td>
</tr>
<tr>
<td>Score</td>
<td>Research/Identification</td>
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<tr>
<td>-------</td>
<td>----------------------------------------------------------------------------------------</td>
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<tr>
<td>3</td>
<td>Student successfully researches and accurately applies the criteria for destructive and constructive forces to calderas, geysers, tsunamis, moraines, and hurricanes. Student makes deep and unique reflections on their findings.</td>
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<tr>
<td>2</td>
<td>Student researches and can apply the criteria for destructive and constructive forces to most of calderas, geysers, tsunamis, moraines, or hurricanes. Student makes reflections on their findings.</td>
</tr>
<tr>
<td>1</td>
<td>Student researches and can apply the criteria for destructive and constructive forces to most of calderas, geysers, tsunamis, moraines, or hurricanes. Students made minimal reflections on their findings. The student did not make any reflections on their findings.</td>
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