

SCIENCE – GRADE 5

Grade: 5

Academic Standard: 5.1

Academic Standard Indicator: 5.1.3

Core Standard: Yes

Standard Description (Academic or Indicator): Explain that doing science involves many different kinds of work and engages men, women, and children of all ages and backgrounds.

Suggestion for Integrating International Content: Have students research about scientists from around the world who work or have worked in different scientific fields. Then have students share their findings with the class, focusing on the range of genders, ages, and scientific fields of scientists from around the world throughout history.

Grade: 5

Academic Standard: 5.1

Academic Standard Indicator: 5.1.5

Core Standard: Yes

Standard Description (Academic or Indicator): Explain that technology extends the ability of people to make positive and/or negative changes in the world.

Suggestion for Integrating International Content: Have students brainstorm examples of situations in which new technology had unexpected positive and negative effects on the world. *Example:* Styrofoam, invented in 1941, is a lightweight and buoyant insulation, thereby making it a good material for nautical applications. Unfortunately, it breaks apart and can choke marine animals, not to mention that it can take up to a million years to decompose.

Grade: 5

Academic Standard: 5.1

Academic Standard Indicator: 5.1.5

Core Standard: Yes

Standard Description (Academic or Indicator): Explain that technology extends the ability of people to make positive and/or negative changes in the world.

Suggestion for Integrating International

Content: With students, brainstorm examples of situations in which new technology had unexpected positive and negative effects on the world. Have students consider how the solution to a problem using the interaction between science and technology may create other problems.

Grade: 5

Academic Standard: 5.1

Academic Standard Indicator: 5.1.5

Core Standard: Yes

Standard Description (Academic or Indicator): Explain that technology extends the ability of people to make positive and/or negative changes in the world.

Suggestion for Integrating International

Content: Have students understand the effects of new technology by researching technologies developed in Indiana that are changing the world, such as engineering, life sciences, medical, and pharmaceutical innovations.

Grade: 5

Academic Standard: 5.1

Academic Standard Indicator: 5.1.6

Core Standard: Yes

Standard Description (Academic or Indicator): Explain how the solution to one problem, such as the use of pesticides in agriculture or the use of dumps for waste disposal, may create other problems.

Suggestion for Integrating International

Content: Illustrate how solutions to one problem can lead to others. *Example:* Insects eat crops, so farmers use pesticides to kill them. Unfortunately, pesticides get into the groundwater and pollute the streams and rivers of the world. *Example:* People need places to live and farm in the Amazon, which leads to them cutting down and burning the forest. This leads to fewer habitats for songbirds that migrate to and from North America and fewer trees to take in carbon dioxide and release oxygen.

Grade: 5

Academic Standard: 5.2

Academic Standard Indicator: 5.2.3

Core Standard: No

Standard Description (Academic or Indicator): Choose appropriate common materials for making simple mechanical constructions and repairing things.

Suggestion for Integrating International

Content: Discuss how many things in American life are no longer repaired, but are thrown away instead if they break or get in bad shape. Have students imagine that they are hiking in a foreign country with one backpack full of supplies and they do not have any local money to buy more things. One of their shirts gets a hole in it. What can they use to repair it? *Extension:* What if the metal frame of their backpack breaks? What could they use to repair it?

Grade: 5

Academic Standard: 5.2

Academic Standard Indicator: 5.2.6

Core Standard: No

Standard Description (Academic or Indicator): Write instructions that others can follow in carrying out a procedure.

Suggestion for Integrating International

Content: Have students create instructions that others, no matter what culture they are from, can follow in carrying out a procedure. The procedure should focus on both textual and non-textual clues to support learners from all cultures.

Grade: 5

Academic Standard: 5.3

Academic Standard Indicator: --

Core Standard: No

Standard Description (Academic or Indicator): Students continue to investigate changes of Earth and the sky. They explore, describe, and classify materials, motion, and energy.

Suggestion for Integrating International

Content: Have students research the pattern of

weather changes throughout the year in their school location and in selected countries. Then have them explain how weather can be forecast by examining air masses that move across the surface of the earth, affecting their location and the selected countries.

Grade: 5

Academic Standard: 5.3

Academic Standard Indicator: --

Core Standard: No

Standard Description (Academic or Indicator): Students continue to investigate changes of Earth and the sky. They explore, describe, and classify materials, motion, and energy.

Suggestion for Integrating International

Content: Have students compare energy conservation policies and practices, both locally and globally. Have them examine earth systems, such as air masses moving across the earth's surface, or global responses to natural disasters like the 2004 Asian tsunami.

Grade: 5

Academic Standard: 5.4

Academic Standard Indicator: 5.4.1

Core Standard: Yes

Standard Description (Academic or Indicator): Explain that for offspring to resemble their parents there must be a reliable way to transfer information from one generation to the next.

Suggestion for Integrating International

Content: Have students consider ancestor interrelationships and genetic characteristics contributed by the many immigrant groups in the U.S.

Grade: 5

Academic Standard: 5.4

Academic Standard Indicator: 5.4.1

Core Standard: Yes

Standard Description (Academic or Indicator): Explain that for offspring to resemble their parents there must be a reliable

way to transfer information from one generation to the next.

Suggestion for Integrating International

Content: Have students research their ancestors by interviewing family members for information. Have them discover if they share any characteristics with their parents and/or grandparents. Have them research their nationalities to see if they share typical related characteristics. *Example:* Blonde hair and blue eyes are common in people of German heritage.

Grade: 5

Academic Standard: 5.4

Academic Standard Indicator: 5.4.4

Core Standard: Yes

Standard Description (Academic or

Indicator): Explain that in any particular environment, some kinds of plants and animals survive well, some do not survive as well, and some cannot survive at all.

Suggestion for Integrating International

Content: Have student groups choose different habitats from around the world to research. Assign each group three separate animals (such as dolphin, dog, and polar bear) to evaluate which of these animals could survive in their chosen habitat, if any. Discuss how different adaptations made by certain organisms make it easier for them to survive in their home environment. Share that humans have also adapted in this way. *Example:* Being a carrier of sickle-cell anemia gives a certain resistance to malaria.

Grade: 5

Academic Standard: 5.4

Academic Standard Indicator: 5.4.5

Core Standard: Yes

Standard Description (Academic or

Indicator): Explain how changes in an organism's habitat are sometimes beneficial and sometimes harmful.

Suggestion for Integrating International

Content: Have students consider invasive species that are introduced into an environment where they don't have any natural predators. Have students explain how the invasive species

benefit from the change to a new environment.

Example: Kudzu is a plant that was introduced into the U.S. from Japan in 1876 in the southeast and has since grown out of control.

Grade: 5

Academic Standard: 5.4

Academic Standard Indicator: 5.4.7

Core Standard: Yes

Standard Description (Academic or

Indicator): Explain that living things, such as plants and animals, differ in their characteristics, and that sometimes these differences can give members of these groups (plants and animals) an advantage in surviving and reproducing.

Suggestion for Integrating International

Content: Have student groups research different animals from around the world. Assign each group three separate species of the same animal (such as black bear, grizzly bear, and polar bear) to evaluate what adaptations have occurred to make it easier for each to live and breed in particular habitats. Share that humans have also adapted in this way. *Example:* Being a carrier of sickle-cell anemia gives a certain resistance to malaria, thus allowing the person to live longer and reproduce.

Grade: 5

Academic Standard: 5.4

Academic Standard Indicator: 5.4.8

Core Standard: Yes

Standard Description (Academic or

Indicator): Observe that and describe how fossils can be compared to one another and to living organisms according to their similarities and differences.

Suggestion for Integrating International

Content: Show pictures or real examples of fossils from around the world and point out how they resemble some species currently on Earth. Share how similar fossils have been found on the western coast of Africa and the eastern coast of Latin America, thus leading scientists to speculate about the locations of the continents hundreds of millions of years ago. *Extension:* Discuss plate tectonics and how this theory is used to explain both the Africa-Latin America connection, as well as the 2011 Japan tsunami.

Grade: 5**Academic Standard:** 5.5**Academic Standard Indicator:** 5.5.3**Core Standard:** No**Standard Description (Academic or Indicator):** Classify objects in terms of simple figures and solids.**Suggestion for Integrating International****Content:** Show pictures of international buildings or landmarks and have students identify the shapes they see within the structures.**Grade:** 5**Academic Standard:** 5.5**Academic Standard Indicator:** 5.5.4**Core Standard:** No**Standard Description (Academic or Indicator):** Compare shapes in terms of concepts, such as parallel and perpendicular, congruence, and symmetry.**Suggestion for Integrating International****Content:** Have students examine art work of Dutch artist M.C. Escher to compare shapes in terms of symmetry and congruence. **Suggested resource:** <http://www.mcescher.com/>.**Grade:** 5**Academic Standard:** 5.5**Academic Standard Indicator:** 5.5.4**Core Standard:** No**Standard Description (Academic or Indicator):** Compare shapes in terms of concepts, such as parallel and perpendicular, congruence, and symmetry.**Suggestion for Integrating International****Content:** Have students use international flags as visuals to compare shapes in terms of geometric concepts. **Example:** Using the Greek flag, have students identify which parts are perpendicular to each other and which are parallel. **Suggested resource:** <http://www.worldatlas.com/webimage/flags/flagcnty.htm>.**Grade:** 5**Academic Standard:** 5.5**Academic Standard Indicator:** 5.5.5**Core Standard:** No**Standard Description (Academic or Indicator):** Demonstrate that areas of irregular shapes can be found by dividing them into squares and triangles.**Suggestion for Integrating International****Content:** Have students use international flags as visuals to learn the area of complex shapes.**Example:** Have students calculate the area of both the red and white sections of the flags from Bahrain or Qatar. **Suggested resource:** <http://www.worldatlas.com/webimage/flags/flagcnty.htm>.**Grade:** 5**Academic Standard:** 5.5**Academic Standard Indicator:** 5.5.7**Core Standard:** Yes**Standard Description (Academic or Indicator):** Explain that predictions can be based on what is known about the past, assuming that conditions are similar.**Suggestion for Integrating International****Content:** Have students use international information as the basis for making predictions. **Example:** Have students use a chart showing the number of cases a specific disease that have occurred in different parts of the world over a certain number of years. Then have students predict whether selected places will have that disease in the future. **Example:** Have students use climate information of a particular location in the world to predict what the temperatures will be for the next week. Have students check their predictions against <http://www.weather.com> or <http://uk.weather.com>.**Grade:** 5**Academic Standard:** 5.5**Academic Standard Indicator:** 5.5.8**Core Standard:** Yes**Standard Description (Academic or Indicator):** Realize and explain that predictions

may be more accurate if they are based upon large collections of objects or events.

Suggestion for Integrating International

Content: Have students use international information as the basis for making predictions.

Example: Have students use the weather from the previous week, at a particular location in the world, to predict temperatures for the next week. Have students check the predictions against <http://www.weather.com> or <http://uk.weather.com>. Have students discuss how more background information might lead to more accurate predictions.

occupy any part of the Sahara Desert. Then ask students to determine if the statement is correct: Does the Sahara Desert actually cover most of Africa? Then have students analyze how much more data they would need, beyond their list of countries, to make a more accurate answer.

Grade: 5

Academic Standard: 5.5

Academic Standard Indicator: 5.5.9

Core Standard: Yes

Standard Description (Academic or

Indicator): Show how spreading data out on a number line helps to see what the extremes are, where they pile up, and where the gaps are.

Suggestion for Integrating International

Content: Have students use international information as the raw data for the number line.

Example: Plot on a number line the birthrates of several countries around the world. Then have students observe whether certain areas of the world have higher birthrates than others and which countries have the highest and lowest birthrates.

Grade: 5

Academic Standard: 5.5

Academic Standard Indicator: 5.5.10

Core Standard: Yes

Standard Description (Academic or

Indicator): Explain the danger in using only a portion of the data collected to describe the whole.

Suggestion for Integrating International

Content: Have students use international information as the basis for discerning erroneous descriptions. **Example:** State that “the Sahara Desert covers almost all of Africa.” Show the class a map of Africa pointing out precisely where the Sahara Desert is located and have the class make a list of countries in Africa that