esri Australia

Primary Productivity

Lesson Map: https://esriurl.com/enviroGeoinquiry10mv

Engage

How do we now use remote sensing to assess our planet's health?

→ Click the map URL above to open the map.

? What are some major features of the earth that can be identified? *[Clouds, desert, water, and vegetation.]*

? Does this picture tell the whole story of what is happening on the earth's surface? *[No]*

? What are some other ways to gain a more complete picture of the earth's surface processes? *[Pictures in different wavelengths of light.]*

Download student worksheet here.

Time
30 minutes

Activity
Explore abiotic factors associated with primary productivity.

Learning Outcome
Students will be able to:

- Evaluate and describe how living and nonliving entities interact in ecosystem-level ecology.

ACARA Curriculum Link
Year 9 Geography: Biomes and food security

ACHGK060

Unit 4 Senior Curriculum: Earth and Environmental Science

ACSES106

Teacher Feedback:

To share your feedback on this, or any Spatial Activity, please contact education@esriaustralia.com.au

Explore

How does vegetation type and distribution vary around the globe?

→ Click **Layers** on the dark toolbar.

→ Turn on the layer **Leaf Area Index March 2016** by clicking its eye icon in the **Layers** list.

→ Click **Search** on the map. Use the search box in the upper-left corner of the map to search for your school address. A dark grey circle is placed there on the map.

? What is the approximate leaf cover in your area? (You may need to zoom out.)
[Answers will vary].

? Continue zooming out. What patterns of vegetation do you notice on a larger
scale? *[Answers will vary].*

Explain

How are patterns of vegetation related to seasonal change?

→ Turn on the layer **Leaf Area Index September 2015.**

? What differences do you notice compared to the March 2016 map? *[There is more
leaf cover, specifically in the northern hemisphere.]*

? What are some generalizations that can be made regarding seasonal changes to
vegetation? *[Increasing vegetation from spring into summer; reduced vegetation
through fall and into winter.]*

Elaborate

How is vegetation related to abiotic factors like carbon dioxide?

? What is the relationship between vegetation and the amount of carbon dioxide in
the atmosphere? *[More vegetation leads to lessor amounts of CO2.]*

→ Net primary productivity is the difference in CO2 absorbed by plants and CO2
released by plants.

→ Turn on the layer **Net Primary Productivity** by pointing your mouse at it in the Layers
pane and clicking the eye icon again. Turn it on and off to compare it and the
vegetation layer (September 2015).

? What generalizations about cause and effect can be made? *[More vegetation leads
to higher net primary productivity.]*

? What are some potential questions that you might have about the relationship of
vegetation to other abiotic factors? *[Responses will vary].*

Evaluate

What factors affect the variance in net primary productivity?

? What factors may affect productivity? *[Rainfall, temperature, sunlight, and soil
types.]*

→ Select one factor and explain how it might positively or negatively affect net primary
productivity.

? Using the remaining two layers, Forest Fires and Rainfall, what evidence do you have to support an explanation of a positive or negative impact on net primary productivity? *[Answers will vary.]*

Next Steps:

Request a free ArcGIS Online Account for your school:

Australian schools can request a free ArcGIS Online account as part of Esri Australia's Classroom GIS Initiative. A school subscription provides additional map layers, content, features, and privacy.

Learn more about ArcGIS Online, and apply for your ArcGIS Online School subscription at http://esriaustralia.com.au/education