Oats, Peas, Beans and Barley Grow

What are the benefits of cover crops?

Target Grade Levels: 9-12
Subject Areas: Earth Science
Time Required: Ten - 45 minute class periods over three months

Lesson Objectives:
1. Planning investigations
   - The main focus of this lesson is to get students planning their own experiment. The process takes time and focuses on feedback at different steps of the process.
2. Develop and use models
   - Students will use stream tables to model soil erosion or nutrient leaching or they can come up with their own ideas.
3. Analyzing data
   - Students will organize their data using charts and graphs. This data will be reviewed before their final product is completed.
4. Communicating Information
   - Students will create a poster showcasing their experiment. After the first draft is completed, they will receive feedback before completing their final revisions.

Materials Required:
- Seeds for various cover crops
- Stream Tables
- Planting Trays
- Google Classroom or equivalent

Lesson Summary

Cover crops are used for a variety of purposes in agriculture. This lesson will allow students to explore the benefits of cover crops. Based on their research findings, students will choose one aspect of cover crops to explore in depth for their research project.

Possible areas of exploration include:
- Soil erosion
- Nutrient run off
- Soil improvement
- Water conservation

The main focus of this project is for students to design and implement an experiment. Students will receive feedback on their experimental design, data analysis and poster from resources outside the class room which they can incorporate into their procedures.

Potential sources for feedback are university partnerships, local industry, or students and teachers within the building.

Partners

Leonor Leandro, PhD, Department of Plant Pathology and Microbiology, Iowa State University

ISURet2015
http://www.cbirc.iastate.edu/education/precollege/ret/
Lesson Plans

Research and Planning: 2-3 45 minute class periods
Design Feedback: One 45 minute class period
Plant cover crops (grow at home) 5-6 weeks later...
Run experiment: Two 45 minute class periods
Data Transformation: One 45 minute class period
Poster Draft: One 45 minute class period
Comments on Posters (may need a week)
Finalize Poster: One 45 minute class period
Share! One or Two 45 minute class periods

Differentiation

Provide extra assistance for struggling students in experimental design.
Allow students to come up with their own ideas or complete additional experiments.

Recommended cover crops

- Rye (grass)
- Red Clover (legume)
- Radish (brassica)
- Wheat (grass)
- Hairy vetch (legume)
- Mustard (brassica)

Resources

CPO Science Stream Tables
http://www.cposcience.com/home/Portals/2/Media/post_sale_content/PES/PES_Chap_22/StudentRecordSheets/PES_INV_AS_22A.pdf

Cover Crops
http://practicalfarmers.org/member-priorities/cover-crops/

http://www.slideshare.net/SWCSevents/cover-crop-seed-innovation-blackmer