

EDCI 62700

PBL Challenge

Investigating a National and Local Problem

Our Activity

- ▶ We are going to spend most of this week investigating an issue of importance to the U.S., but set in the context of Indiana's specific needs as well as its ability to address those needs.
 - ▶ You will work as part of a team to conduct and report on a specific investigation.
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Activity Steps

- ▶ As part of this process, each team will:
 - Develop a specific investigative question
 - Plan how to conduct the investigation
 - Collect data (from field and/or websites as needed) and analyze it
 - Do background research, and organize the information and data
 - Prepare a 15-minute multimedia presentation to share your investigation and results with others

Technology's Role

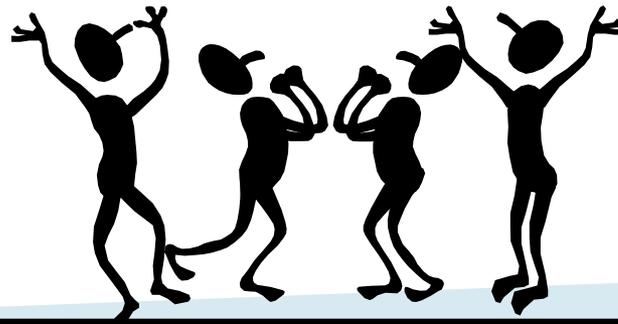
- ▶ Gather background information —▶ Internet and World Wide Web
- ▶ Organize and present data —▶ Excel spreadsheet and graph
- ▶ Produce artifacts of the activity —▶ Digital camera, word processor
- ▶ Create a multimedia presentation to share with others —▶ PowerPoint presentation

These are only ideas; you may have others.

Our Activity

- ▶ See the Course Schedule for details about the timeline that we will follow for the next few days.
- ▶ Be prepared...
 - For hands-on activity (possibly outside).
 - To use your skills and expertise to help your group.
 - To have some fun while learning!

Doing a Problem/ Project-Based Investigation



Warm Up Activity

- ▶ First...
 - We will have a short challenge activity to get warmed up

An investigation with UV beads

Our Main Investigation



Background Information

- ▶ How much do you know about energy?
 - ▶ Engage in introductory energy activity
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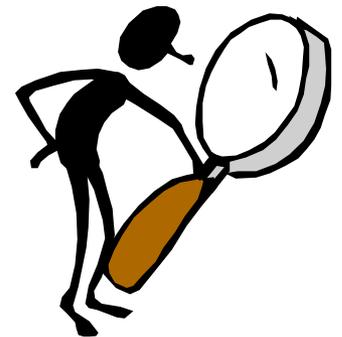


How can Indiana, and the U.S., develop energy independence?



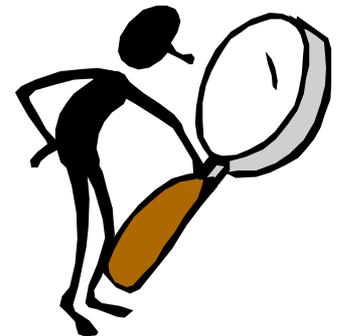
Recent *Journal & Courier* Headlines

- ▶ **Duke Energy manager says demand will rise 35% by '30**
 - Oct 16, 2010 Duke Energy, which has more than 700,000 electric customers in Indiana, is purchasing more than 1,000 megawatts of electricity from wind turbine projects around the country, including 100 megawatts from a wind farm in Benton County. "Green is here to stay," Kevin Johnston said, in reference to renewable energy sources. "We are pushing some green power alternatives. We're also investing in solar."



Recent *Journal & Courier* Headlines

- ▶ **Governor pushes home-grown energy**
 - Aug 12, 2006 Officials with the Indiana Coalition for Renewable Energy and Economic Development said *Daniels could have included a greater emphasis on renewable energy sources, such as wind or solar power...*
- ▶ **Purdue researcher: Ethanol has peaked**
 - Jan 10, 2011 According to Wally Tyner, the use of ethanol in the U.S. has reached its saturation point. Developing next-generation biofuels, such as ones produced from algae or another biomass, is the only way to reach the federal mandate for renewable fuel use, due to a lack of infrastructure in the US for ethanol ...





Recent *Journal & Courier* Headlines

▶ **Noise limit still up in the air**

- Dec 4, 2010 As wind energy farms prepare to sprout in Tippecanoe county, some residents are fighting a proposal that would allow for more noise – and they fear nuisance – from the developments ...

▶ **Doubt cast on cob-based biofuels**

- Sept 7, 2010 To determine economic feasibility, investigators examined a range of assumptions for cob collection, including the cost of cob-harvest equipment, the amount of time harvest is slowed by adding a cob-collection operation, the volume of cobs that could be collected per acre and other factors -- including the standard \$28,000 seasonal rate to rent collection wagons during the harvest ...

Recent *Journal & Courier* Headlines

▶ **Few bright spots for BioTown**

- July/Aug 2009 ... Four years ago, Reynolds IN received national attention when the state outlined ambitious goals for the community – declaring it BioTown, USA. Today, interest in renewable energy remains in the tiny White County town, *but the fate of key initiatives is uncertain.*

▶ **Wind mill rule changes are troublesome**

- Nov 23, 2010 ... Repeated modifications to the Tippecanoe County wind energy ordinance are a disservice to those planning to build wind farms and those who eventually will have to live in the turbines' shadows ...

Our Driving Question(s)

- ▶ How can Indiana meet its energy demands over the next 20 years, while still increasing our standard of living?
- ▶ Which alternative energy sources make sense for Indiana?



Brainstorming

- ▶ What do we need to know to answer this question?
- ▶ What questions do you have for our energy experts?

How can Indiana meet its energy demands over the next 20 years?



Your Investigation

How can Indiana meet its energy demands over the next 20 years?

Housekeeping

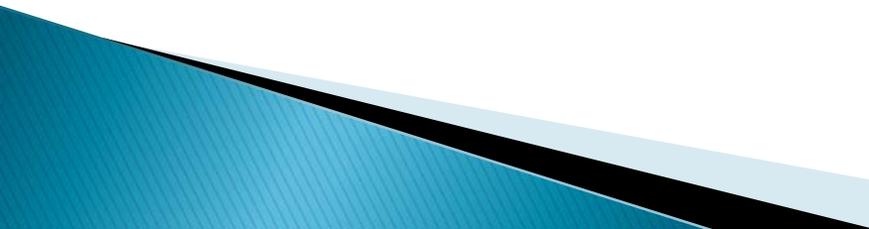
- ▶ Meet with your energy team members
- ▶ Give your company a name
 - Be creative
 - Incorporate reference to your specific energy source



Developing Your Investigation

- ▶ In your group, brainstorm the issues / topics that might be investigated with regard to our driving question and your specific energy source...
 - ▶ Weigh the pros and cons of particular investigation topics.
 - ▶ Decide on a specific investigative question you would like to address during the remainder of the week.
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Investigation Considerations

- ▶ Does it address the driving question?
 - ▶ Does it relate to STEM content standards?
 - ▶ Is it understandable and clearly stated?
 - ▶ Is it testable? Can you gather data?
 - ▶ Do we have the resources needed to do the investigation?
 - ▶ Can it be done in our time frame?
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Today's Outcome

- ▶ The goal for today is for your group to *identify your specific investigative question.*
 - ▶ Tomorrow, you should be prepared to begin planning and conducting your investigation.
 - ▶ Work on identifying your investigation question now. When you are ready, ask the instructors to approve your question.
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Tuesday's Activities/Goals

- ▶ Planning your group's investigation
- ▶ Planning the end product



Planning Your Group's Investigation



Planning Considerations

- ▶ What background information do you need? Where can you find it?
 - ▶ What data will you collect? How? Where?
 - ▶ How will you document what you do?
 - ▶ What kind of artifacts will you produce?
 - ▶ How will you present your results?
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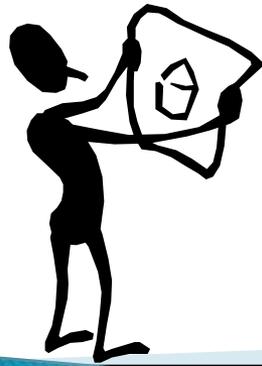
Planning Considerations

- ▶ What timeline will you need to follow to gather your information? Might some things need to be done before others?
 - ▶ How can you divide labor to make the process efficient?
 - ▶ How can you make use of the skills and knowledge of group members?
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Planning Considerations

- ▶ Are there other logistical considerations to keep in mind?
 - ▶ Keep the schedule in mind and manage your time
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Planning the End Product



Presentation

- ▶ Prepare a 15-minute presentation about your investigation, to be shared with everyone on Friday, using PowerPoint.

Key Presentation Components

- ▶ What was your investigative question?
 - ▶ Who worked on your team? How will team members contribute to the presentation?
 - ▶ How did you conduct your investigation?
 - ▶ What did you discover?
 - ▶ What does it mean? How does it relate back to our driving question?
 - ▶ What action steps might follow?
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Questions?

