

Intel® Innovation in Education

Institutes

Supporting Causeand-Effect Thinking

Seeing Reason, An Online Mapping Tool





Supporting Cause-and-Effect Thinking

Seeing Reason, an Online Mapping Tool

The Intel® Innovation in Education Institutes' Web resources contain all the materials you need to present a successful workshop including:

- This document
- Participant handouts
- Workshop slides

These workshop materials assume that you:

- Have education experience in the classroom
- Have taken the workshop
- Have thoroughly reviewed and are familiar with the workshop resources
- Are familiar with the Intel[®] Innovation in Education Web site
- Are familiar with using the Internet
- Have a high-speed Internet connection to use during the workshop

Technical Requirements

To give the workshop, you'll need a technology lab setting with high-speed Internet access and the following equipment:

- Presenter's workstation equipped with:
 - A computer with a high-speed Internet connection
 - Screen
 - Computer projector
- Wireless mike (depending on room size and acoustics)
- Computers with high-speed Internet connection for participants (maximum of 2 participants per workstation)

For more information, on the computer requirements, see Site Recommendations www.intel.com/education/site support/recommendations.htm



Preparation

Study the resources available on the Intel[®] in Education Web site for *Seeing Reason*. Review the materials under each of the five circles from the *Seeing Reason* main page: www.intel.com/education/seeingreason.

Practice using the Teacher Workspace and online mapping tool by making maps.

- 1. Go to Seeing Reason: www.intel.com/education/seeingreason
- 2. Select Try Out the Tool.
- 3. Practice reading the "Try It" map. The screen shows an example of a map about traffic jams.
- 4. Click factors and relationships to see how they are described and justified.
- 5. Update the traffic jam example, or clear the map and create your own.
- 6. Refer to the "Helpful Guides" to the right of the map as you work.

Using **your own Teacher Workspace**, set up a "Becoming Leader of Our Country" project and assign teams.

When you assign student teams, use the IDs and passwords to match computers in lab. For example: Team ID: 01, Team Password: 01.

Day of the Workshop

Use sticky notes and number computers 01, 02, 03...10, 11, etc.

Post sticky notes with the computer numbers on the top of each monitor.

Post login information on white board or chart pad.

On the presenter's workstation, open two browser windows: one to the workshop slides and another to the Intel[®] Innovation in Education Web site. You'll toggle between these browser windows during the presentation.



Goals

- Learn how causal mapping supports collaborative thinking processes.
- Learn to use the Seeing Reason causal mapping tool.
- Understand how to set up and manage projects using the teacher workspace.

Agenda

Total estimated time 2 hours 45 minutes

Topics	Estimated Time	Slide Numbers
Welcome	10 minutes	Slides 1–3
Overview and Goals	10 minutes	Slides 4–5
Consider Mapping	10 minutes	Slides 6–9
Learn About Causal Mapping	15 minutes	Slides 10–15
Try it Yourself	10 minutes	Slide 16
Discuss Team Work	30 minutes	Slides 17–21
Examine Teacher Resources	15 minutes	Slide 22
View Classroom Projects	15 minutes	Slide 23
Start a Project	45 minutes	Slides 24–30
Wrap Up	5 minutes	Slide 31



Welcome to

Supporting Cause-and-Effect Thinking

Seeing Reason, an Online Mapping Tool

Workshop



Key Points Notes

Time: 10 min. Slides 1-3

Display this slide as participants enter the room.

If appropriate, introduce yourself and have participants introduce themselves.



About Intel in Education

The Intel[®] Innovation in Education initiative:

- Has invested more than \$700 million worldwide in education efforts through 2003
- Collaborates with leaders from education, governments, industry, academia, and research organizations
- Designs and delivers programs in more than **50 countries on six continents**
- Gives teachers tools, strategies, and resources, free-of-charge, that they can use to make a difference in the classroom

This long-term, sustained initiative consists of several programs:

- Intel® Innovation in Education Web site
- Intel[®] Teach to the Future
- Intel Computer Clubhouse Network
- Intel sponsored science competitions
 - o Intel Science Talent Search (Intel STS)
 - o Intel International Science and Engineering Fair (Intel ISEF)

Key Points Notes

Time: 10 min. Slides 1-3

Provide an overview of Intel's efforts in and commitment to education.





Time: 10 min. Slides 1-3

Display the Intel[®] Innovation in Education Web site home page to make participants familiar with it as a source of Intel resources for educators.

Point out the location of *Design and Discovery* on the Intel[®] Innovation in Education home page (in the left navigation bar under Learning Anytime).



Overview and Goals

Intel® Innovation in Education offers the Seeing Reason online causal mapping tool to help:

- Teachers construct meaningful projects
- Students engage in reasoning about complex problems

Goals

- Learn how causal mapping supports collaborative thinking processes
- Learn to use the Seeing Reason causal mapping tool
- Understand how to set up and manage projects using the teacher workspace

Key Points Notes

Time: 10 min. Slides 4-5

Present the goals of the workshop to set the stage for the concepts and activities to follow.



Agenda

Welcome

Overview and Goals

Consider Mapping

Learn About Causal Mapping

Discuss Team Work

Examine Teacher Resources

View Classroom Projects

Start a Project

Wrap Up

Key Points Notes

Time: 10 min. Slides 4-5

Briefly present the agenda to be covered in the workshop.

Describe that it's a hands-on session that alternates between:

- These slides and the live site
- Demonstration and discussion
- Guided and independent practice
- Analysis of maps and review of resources, including project examples

Explain that participants will have time to explore a *Design and Discovery* project idea and use the online teacher workspace to plan classes for their students.



Consider Mapping

Concepts maps are already used in many classrooms.

Consider this scenario: A visiting teacher asks about concept maps displayed in the hallway. The teacher wonders:

- What is the purpose of concept mapping?
- Why are students encouraged to make concept maps?
- What do teachers and students do with concept maps?

Turn to a neighbor and discuss your reply.



Key Points Notes

Time: 10 min. Slides 6-9

Verify that concept maps are used in classrooms.

Introduce the scenario on the slide. In pairs or small groups, have participants discuss the questions on the slide. Let groups share responses. Draw out the following concepts:

How are maps used

Organize thinking; communicate understanding; show how ideas relate to one another; show initial understanding while setting the stage for new learning

Why map?

Ideas are visible and can be discussed; replaces outlining (less linear); less reliance on language and more on pictures and symbols

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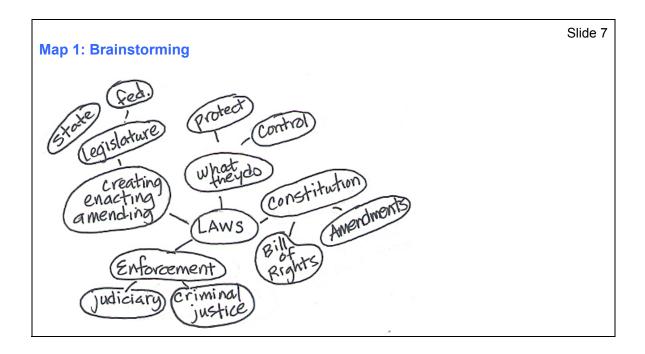


What is done with maps?

Use as discussion aid; allow teachers to assess understanding and drive inquiry (moving from 'what I know' to 'what I don't know')

Ask whether any teacher might find it useful to have learners return to and modify maps.





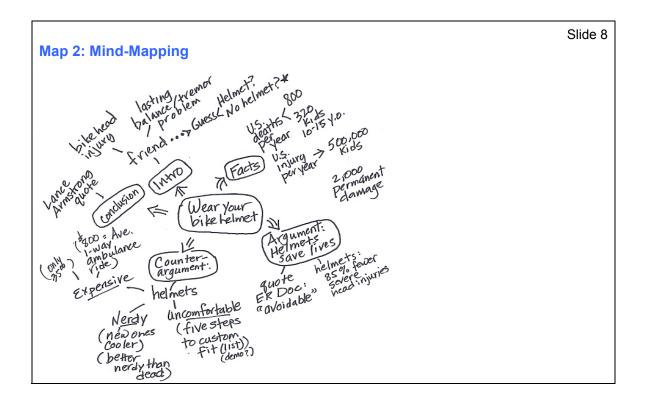
Time: 10 min. Slides 6-9

Explain that this is an example of a brainstorming map which:

- Has no constraints
- Allows the mapmaker to express ideas in loosely organized ways.

Point out that brainstorming maps present the opportunity to go from what the mapmaker knows to what the mapmaker does not know.





Time: 10 min. Slides 6-9

Explain that some mind maps express different relationships, sometimes many, at a glance. Relationship links may include categories, hierarchies, and/or sequences, etc.

Ask participants what they think this map is about. Expect to elicit answers like:

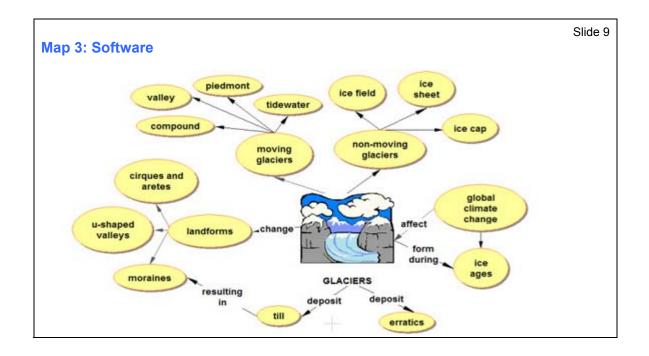
- Persuasion for safety
- Basis for report or speech

Ask whether participants see any sort of organization in the map. Expect responses like:

- Sequential
- Clockwise through argument
- Counterargument

Note that this map is similar to a non-linear outline.





Time: 10 min. Slides 6-9

Explain that this is an example of a map made with commercial software.

Ask if participants have used commercial software for mapmaking. If so, what were the:

- Benefits?
 (Answers may include image libraries, labeled relationships, conversion of maps to outlines, templates for different types of maps, etc.)
- Risks?
 (For example, the software may be so robust that students get caught up in imagery and features, lose sight of concepts.)



Learn About Causal Mapping

Causal maps are concept maps that express cause-and-effect relationships.

Consider:

My last fill-up at the gas station cost me \$32.60.

What factors influence the price of gasoline?

Contribute to a map.



Key Points Notes

Time: 15 min. Slides 10-15

Explain that Seeing Reason supports cause-andeffect, or causal mapping.

(The open space in the image is space to create a map.)

Ask participants to tell you about the causes of high gas prices.

Guide responses toward cause-and-effect statements. Probe for contributing and subordinate factors. (It is helpful to organize factors as they are offered.)

continued on next page



Demonstrate mapping. Click the "Contribute to a map" link and clear the map.

Ask participants to restate the factors and their relationships effecting gas prices. Map the factors and relationships as they are proposed.

Probe for chains of factors.

Have participants clarify the meaning of factors and record the meanings in the "describe factor" field. Ask for justification of relationships (data, evidence), and record responses in the "describe relationships" field.

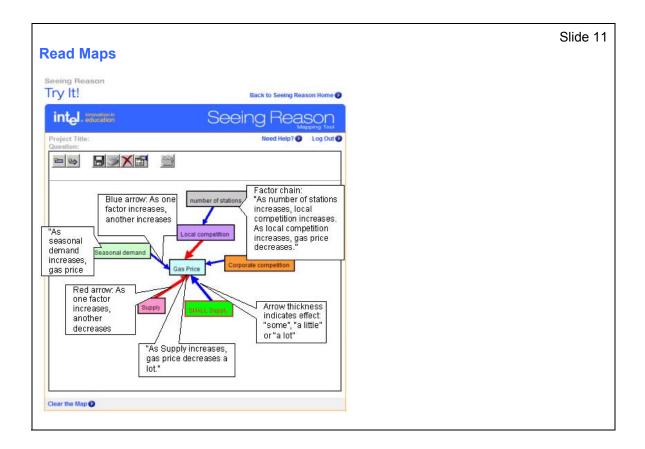
After a small map is made, halt discussion and "deconstruct" the map.

Key points:

- "Chains" of factors develop quickly.
- Students reconsider and refine factors and relationships when they have to describe them.

Explain that it is likely students will increase their understanding of the mapping process if teachers use this collective mapmaking exercise in their classrooms.



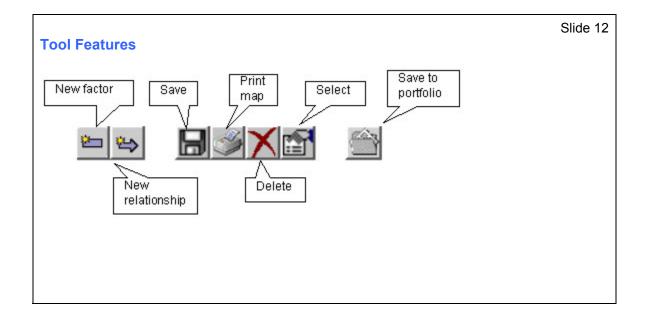


Time: 15 min. Slides 10-15

State that in a project set up by a teacher, the question students investigate appears above the tool bar and students start with a blank space for a map.

Explain that arrows indicate a relationship among/between factors. Colors and weights of the arrows signify the types and levels of effects one factor has on another.



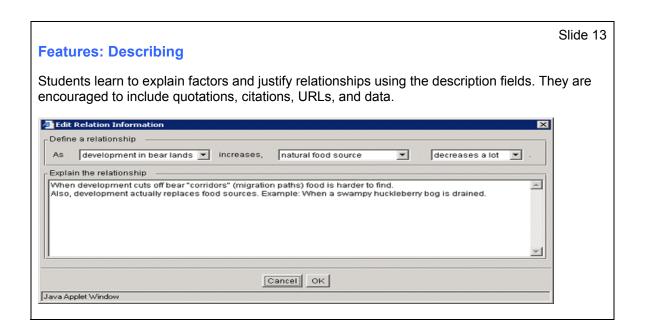


Time: 15 min. Slides 10-15

Point out the toolbar icon buttons for features and functions that are used to create, use, and save a map.

Demonstrate and explain the function of each icon button.





Time: 15 min. Slides 10-15

Explain that describing factors and relationships allows learners to:

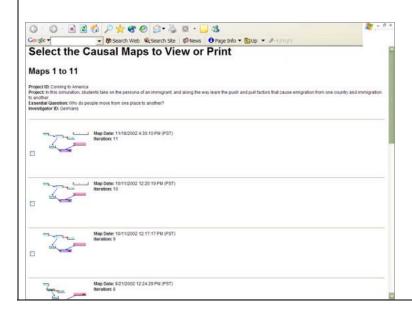
- Clarify the meaning of a factor name.
- Add data or explanation to justify or quantify factors and/or relationships.
- Add notes about further research or investigation



Features: Saving and Viewing

As their research progresses, students add to and change their maps. Each time a map is saved it's added to a series of map iterations. The teacher can select and view any or all maps a team has made.

Map iterations act as a window into changing understanding, and help the teacher guide learning processes.



Key Points Notes

Time: 15 min. Slides 10-15

Explain that teachers can see how learners' thinking changes over time by viewing iterations of maps and teachers can intervene to guide learning, when necessary.

Point out that in this thumbnail view, the teacher can:

- Get a quick sense of how work is progressing
- Select specific maps to view or manage

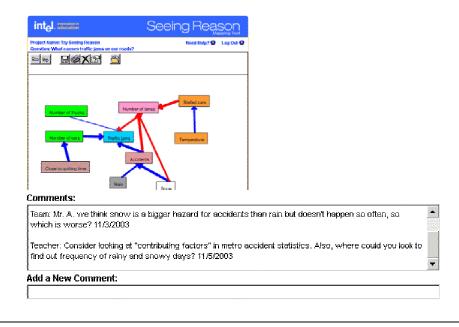


Features: Commenting

The Comments feature allows teachers and students to communicate about the progress of their investigations. Comments are saved sequentially.

Comments are useful when the teacher and students are apart, for example, when:

- A team works outside of class
- A teacher reviews maps after school



Key Points Notes

Time: 15 min. Slides 10-15

Explain that the Comments feature:

- Allows for asynchronous communication about the project
- Creates a sequential record of correspondence

Ask if there are any questions about using the Seeing Reason mapping tool.



Try It Yourself

In your browser:

- 1. Go to Intel® Innovation in Education: www.intel.com/education.
- 2. Select Seeing Reason in the left navigation bar.
- 3. Select Try Out the Tool.
- 4. Practice reading the "Try It" map. The screen shows and example of a map investigating the cause of traffic. Click factors and relationships to see how they are described and justified.



5. Update the traffic example, or clear the map and create your own. Refer to the "Helpful Guides" at the right of the map as you work.



Key Points Notes

Time: 10 min. Slide 16

Demonstrate navigation to Try Out the Tool (steps 1–3 on the slide).

Participant teams to use the tool for 10 minutes.

Circulate, answer questions, and help with mapmaking functions, as needed. Encourage participants to read their factor relationships to one another and to you.



Discuss Team Work

As you worked on the maps:

- How did you decide what went into your map?
- What was team communication like?

What comments or questions do you have



Key Points Notes

Time: 30 min. Slides 17-21

Point out that the noise level in room rose as the activity began—ideas became overt and discussion naturally ensued.

Discuss participants' experiences during the mapmaking exercise.

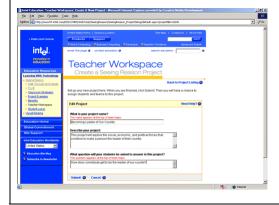
Answer participant questions.



Make Maps

You will be making maps as teams in a social studies class. A teacher set up this class project, "Becoming Leader."

The question "How does somebody get to be the leader of our country?" will appear above the student maps.



Key Points Notes

Time: 30 min. Slides 17-21

Demonstrate login in to Teacher Workspace and show this view of the project planning page.

Introduce this two-part activity.

- 1. Participants experience mapping as student teams do.
- 2. Participants view maps created during this session much as teachers would.

Explain that you will act as a teacher while they work.

Leads to follow-up discussions of the benefits and challenges of building cause-and-effect maps.



Log In

Your task:

- 1. Log-in as a student team.
 - Teacher ID: Leader
 - Team ID: See sticky note at your computer
 - Password: Same as the Team ID
- 2. Make a first map to show understanding of the research question that appears above the map.
- 3. Make a comment to the "teacher."
- 4. Save map twice, the second time to the portfolio.



Key Points Notes

Time: 30 min. Slides 17-21

Working in pairs, have participants create a map for the question posed on slide 18.

Model inquiry learning language by asking participants questions such as:

What do you mean by...? What evidence do you have for...?

Are there other factors that contribute to...?

During mapmaking, make note of interesting maps and interactions to feature during the review that follows.

As the activity closes, remind participants to save maps and use the "Comment" feature.



Review the Maps

A teacher can review the most current team maps or view earlier maps that students have saved using the <u>Teacher Workspace</u>.

As you view maps, think about:

- What maps communicate
- How maps vary from team to team
- · Questions you might ask a team



Key Points Notes

Time: 30 min. Slides 17-21

Explain that the Manage Team Maps page is where the teacher sets up teams and views team maps.

- Log in to the Seeing Reason Teacher Workspace and review teams' maps from Manage Team Maps screen.
- Present team maps, encourage participants to comment and ask questions of the different teams.
- Refer to interesting maps and interactions about maps that you noted during the activity.

Review the options for viewing, printing, and managing maps.



Outcomes of Mapping

Building maps is a learning process; Maps are not a learning outcome.

- Maps reveal student's initial thinking and growth in thinking.
- Mapping leads to further investigation and work.

Key Points Notes

Time: 30 min. Slides 17-21

Discuss experiences while viewing team maps.

Explain that maps aren't results, and are not graded. Ask people to think of project outcomes supported by investigation of a cause-and-effect question. (Possibly an essay, speech, or debate.)

Discuss how sharing maps uncovers other ways to look at a concept.



Examine Teacher Resources

Seeing Reason has supporting Web resources to help you make the best use of the tool.

With a partner, study and discuss these Seeing Reason sections. Questions can guide your conversations.

Walk Through an Example

How can the Seeing Reason tool be useful at different stages in a classroom project?

Classroom Strategies

- What kind of projects and classroom practices work best?
- How does mapping aid assessment?

Benefits

- How does visual mapping support communication among students? Between students and teachers?
- In what ways are different modes of learning supported?
- Do benefits to the student extend beyond the immediate project?









Seeing Reason

Key Points Notes

Time: 15 min. Slide 22

Explain that reviewing the Web resources will aid understanding of the use of the tool.

Group participants in pairs or small teams to review and discuss the resources. Ask participants to use the prompts on this slide as a guide for their discussions and examination.

Lead a brief discussion after the resource examination and answer any questions.



View Classroom Projects

Project examples to get you thinking.

Case Studies

On the Road to Safety is a sixth-grade civics project from Israel. Look for:

- How mapping is introduced and used to define the work ahead
- Ways maps are incorporated into final projects

Forensics: Get a Clue is an eighth-grade integrated science and math project from Idaho. Look for:

- Interdisciplinary project designed by a teaching team
- · Mapping with a twist: matching suspects and evidence

Brief Examples

Look for:

 Applications of causal mapping in ecology, literature, mathematics, social studies, vocational education, and graphic arts



Slide 23

Key Points

Time: 15 min. Slide 23

Notes

Explain that project examples will help participants understand how others have used the tool for projects at different grade levels and in various subject areas.

Group participants in pairs or small teams to review and discuss the *Seeing Reason* projects. Ask participants to use the prompts on this slide as a guide for their discussions and examination.

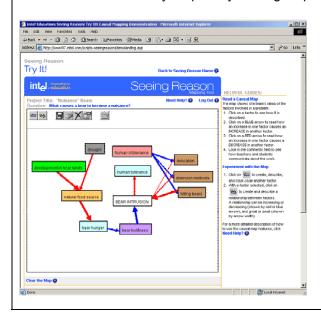
Lead a brief discussion after the examination and answer any questions.



Start a Project

In the next hour, you will:

- Explore a project idea.
- Consider developing a cause-and-effect investigative question.
- Set up project and student teams in the Teacher Workspace.
- Test and revise your plan by making maps.



Key Points Notes

Time: 45 min. Slides 24-30

Introduce the activity as it is described on the slide.

NOTE: This slide introduces the activities covered in the next four slides: 25–29.



Transform Concepts to Questions

A tenth grade social studies class is assigned the project below.

World Health

Some scientists believe the pesticide DDT should be banned from use everywhere in the world. Others believe there are good reasons why some countries should retain the right to spray DDT in a controlled fashion to protect against malaria.

Do the health risks of malaria outweigh the risks of DDT? Are there alternatives? Delegates from around the world will soon gather at a United Nations Environmental Protection conference and vote on this issue.

Study the problem and decide which side you support. Develop a reasoned argument, and write a position paper that could be presented at the world conference.

Discuss: What investigative question might the teacher pose to focus student research?

Key Points Notes

Time: 45 min. Slides 24-30

Explain that planning a good project and causal question takes some thought and practice.

Read the slide's description of a class project.

Ask participants to determine, in small groups, potential cause-and-effect questions students could investigate that would help them complete the assignment (in red).

Hold a large group discussion on results before showing the next slide.

Slide 25



Transform Concepts to Questions II

World Health

Do the health risks of malaria outweigh the risks of DDT? Are there alternatives? Develop a reasoned argument, and write a position paper that could be presented at the world conference.

Study the problem and decide which side you support. Develop a reasoned argument, and write a position paper that could be presented at the world conference.

Possible investigative questions:

- What factors contribute to the transmission of malaria?
- What are the effects of malaria on populations in Africa?
- How effective are different malaria control methods?
- How does DDT affect malaria infection?
- What are the effects of DDT?
- · What are the benefits and costs of using DDT to fight malaria?

Key Points Notes

Time: 45 minutes Slides 24-30

Determine whether the possible investigative questions on the slide match any questions suggested by participants. One, or a combination, of these questions might work.

Have teams of participants examine different investigative questions to get at various aspects of the assignment.

Explain that once a question is devised, but prior to introducing it to students, a teacher should test the question by making trial maps. While there is no "right" question or map, general thinking patterns are revealed when a teacher maps an answer to an investigative question as students would. A likely outcome of this practice is refinement of the investigative question.



Think About Your Project

Task: Meet in teams and discuss project ideas. Consider project topics, investigative questions, and learning outcomes.

Examples

Subject/Concepts	Investigation	Learning Outcome
Social Studies human migrationphysical geography	Why did people settle here?	Draw a map of our area, showing climate and landforms. On clear overlays, map the paths of different groups, and show how they interacted with the physical features.
Math/Economics Supply and demand Production costs Marketing	What factors influence the price of a pair of basketball shoes?	Essay: Write a report describing how to get the best basketball shoes for the lowest price.
Science/Ecology Checks and balances in nature Human intervention	What are the causes and effects of coral death in a reef ecosystem?	Presentation: Provide expert testimony about coral and reef ecosystem health. Propose and justify your choice for the most effective and economic solution.
Literature Plot and character development Literary interpretations of history	How did Richard III contribute to his own unhappiness and eventual demise?	Write an additional scene for the play, wherein Richard's character plainly influences the action in the scene.

Key Points Notes

Time: 45 minutes Slides 24-30

Explain that the slide's examples, along with a note-taking area, are in their handouts for use during the small group discussions. (10 minutes)

Record project ideas, questions, and outcomes from the small group discussions on the whiteboard or with a projected word processing document. (5 minutes)



Furthering Your Plan

A project plan template may be a useful guide as you plan a project.

Consider especially:

- The broad instructional goal
- How the study of a cause-and-effect question helps achieve it

Key Points Notes

Time: 45 minutes Slides 24-30

Download a project plan template and review its main points (5 minutes).

State that participants may find the template useful for planning their projects and that the project plan template is included in their handout packets. Explain that Web location for the template (for downloading) is printed on the handout if they want to download the document.



Set Up a Project in the Seeing Reason Teacher Workspace

Slide 29

- 1. Register.
- 2. Set up a project.
- 3. Set up several teams (can be modified later).
- 4. Set up a "test" team for your own mapping practice.
- 5. Return and revise project as needed.



Key Points Notes

Time: 45 minutes Slides 24-30

Demonstrate the elements of the *Seeing Reason* Teacher Workspace.

Give participants 20 minutes to begin setting up a project.

Circulate to help and answer questions.



Beyond the Workshop

Prepare:

- Practice using the tool
- · Refine your project question by mapping
- Discuss your project concept with colleagues

Refer to the Web site for:

- Planning and implementation
- Project management
- These workshop slides

Refer to the handout for:

- Web site information
- Summary of today's session
- Project examples
- Notes on initial project design
- Project plan template

Key Points Notes

Time: 45 min. Slides 24-30

Summarize the workshop and project planning with the following points:

Review how this initial project planning time will require further mapping and refining before it is ready for use with students.

Suggest the next steps needed for project planning.

Remind participants that the Web site and handout packet will support their continued work on the plan.



Wrap Up

Any questions?

Please complete the online session evaluation at: www.inteleducation.com/institute

Key Points Notes

Time: 5 min. Slide 31

Ask if there are any questions.

Wrap up the workshop.

Thank participants for attending.

Have participants complete the online session evaluation.