



## Project 3D VIEW (Virtual Interactive Environmental Worlds)

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**\*All work for Fall 2011 must be submitted by Dec 1, 2011\***

### Course Description:

Project 3D-VIEW professional development is a comprehensive curriculum that leads students through explorations of the Earth's spheres with a number of 3-dimensional components. Participants will learn science content grounded in Earth's Lithosphere, Hydrosphere, Atmosphere, and Biosphere, and then synthesize their learning in an Earth Systems unit. By learning to use authentic data from NASA and other sources as well as various 3D technologies, participants will experience an exploratory approach to learning about the Earth, and then bring these experiences to their own classrooms. Teachers will utilize several web-based and stand alone 3D tools including animations and hard copy to learn and facilitate student learning of traditional middle school science concepts.

Content topics include—**Lithosphere:** layers of the Earth, plate tectonics, earthquakes, volcanoes, tsunamis, convection, and rock formation; **Hydrosphere:** watersheds, rivers and streams, glaciers and ice, weather, erosion, and deposition, and ocean currents; **Biosphere:** biodiversity, life cycles, photosynthesis, food webs, ecosystems, and nutrient cycling; **Atmosphere:** layers and composition of the atmosphere, heat, air pressure, high and low pressure systems, wind, and cloud formation. **Earth Systems:** renewable and non-renewable resources, energy and energy use, material system cycles, and trade offs and decision making. All units encourage teachers and students to use science process skills—asking questions, performing explorations and investigations, analyzing data, and drawing conclusions. An outstanding “reader” accompanies each unit. The readers weave science content in the writing.

The live online course includes an introduction to the structure and philosophy of the curriculum. The first session jumps into the engaging content and lesson resources organized by unit. The themes and progression of content in each of the 5 units is clearly laid out. Participants in this training will become familiar with the easy to use instructional design and DVD, assessments, rubrics, national standards alignments, and literacy guides that accompany the curricular materials.



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### **Standards-based topic areas include:**

#### Earth Science:

Seasonal Change; Density; Ocean Currents and Heat Transport; Watersheds; Bathymetry; Tides; Temperature and Pressure Changes with Depth; Upwelling

#### Life Science:

Photosynthesis & Productivity; Cell Structures; Biodiversity; Food Chains & Food Webs; Nutrient Cycling; Biotic & Abiotic Factors; Needs of Living Things; Ecosystems; Adaptations of Organisms; Human Impacts on Ecosystems

#### Science Process Skills:

Making and Testing Hypotheses; Data Collection; Data Analysis & Graphing; Image Interpretation; Forming Conclusions; Scientific Instruments; Using Models; Measurement

### **Course Objectives:**

#### Participants will:

- ✓ Demonstrate content knowledge in each of Earth's spheres through activities, discussions, and presentations.
- ✓ Understand the interconnectedness of Earth's spheres.
- ✓ Identify common misconceptions within the content topics, and learn to facilitate activities intended to dispel these myths.
- ✓ Become familiar with a variety of 3D technologies and be able to implement them in the classroom.
- ✓ Access and utilize real-time scientific data from various technologies and sources and apply them to the study of Earth systems.
- ✓ Adopt new and innovative inquiry and technology-based teaching and learning strategies.

**This course is graded on a point scale.**

**A minimum of 55 points must be attempted by October 12, 2011.**

**All work is due by December 1, 2011.**



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### Course Participation:

	Assignment	Maximum Point Value
All participants must complete the mandatory portions of the course and choose from the optional assignments.		
<b>Mandatory 1</b> <b>Due 7/5</b>	Data Connections	<b>10</b>
<b>Mandatory 2</b> <b>Due 7/7</b>	Implementation Plan	<b>10</b>
<b>Mandatory 3</b> <b>Ongoing</b>	Attendance and Preparation	<b>15</b>
<b>Option 1</b>	Full Electronic Portfolio (highly encouraged)	<b>60</b>
<b>Option 2</b>	Truncated Electronic Portfolio	<b>30</b>
<b>Option 3</b>	Investigating Earth's Spheres Paper	<b>20</b>
<b>Option 4</b>	Current Events Paper	<b>20</b>

### Mandatory 1: Data Connections (10 points)

Identify and relate data to 3D-VIEW Lithosphere or Atmosphere content in a 1 page presentation. Data includes any set of observations having to do with “land” or “weather”. It can be represented as graphs, charts, tables, images, maps, and other forms of communication. Choose a data set from a reputable source (government, educational, or research institutions are best) and be sure to cite the source using correct APA or MLA formatting. This can take the form of a very mini lesson designed to make connections to information (can be current) to the concepts in the lessons.

For assistance with proper formatting of sources, visit The Purdue University Online Writing Lab <http://owl.english.purdue.edu/>



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### **Mandatory 2: Implementation Plan (10 points)**

Provide 1-2 paragraphs or an outline answering the following questions:

- 1) How do you intend to implement Project 3D-VIEW in your classroom. This is a brief statement and does not need to include specific dates.
- 2) Based on the training, comment on NASA 3D-VIEW and the specific materials you can replace (and/or blend with) in your curriculum.
- 3) Review the science standards for the state in which you teach for your specific grade level. Align two units of 3D-VIEW curriculum to your state standards.

### **Mandatory 3: Attendance and Preparation (15 points)**

The five online sessions are designed to be interactive and engaging while providing content. Participation in and preparation for the synchronous sessions, including readings and weekly assignments, is strongly encouraged to earn the maximum credit and gain the most from the course.

In addition, you are expected to meaningfully contribute to the course discussion in the Online Learning Space. For each discussion topic, create a substantive post incorporating course content and personal teaching experience or philosophy where appropriate. In addition, you should also respond to the posts of at least two of your fellow learners for each discussion question.

In order to earn full credit, you are expected to be on time for each session and responsive throughout.

### **Asynchronous Assignment Options**

#### **Option 1: Full Electronic Portfolio (possible 60 points)**

You will be creating an electronic portfolio of one or two of the Units to demonstrate successful program implementation. As you implement elements of the curriculum, reflect critically on how the program is helping to improve student interest, understanding, or achievement.

Follow the steps below to complete your portfolio:



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1. Review the course objectives for this course. Along the way you will:
  - ✓ Demonstrate content knowledge in each of Earth's spheres through activities, discussions, and presentations.
  - ✓ Understand the interconnectedness of Earth's spheres.
  - ✓ Identify common misconceptions within the content topics with students, and learn to facilitate activities intended to dispel these myths.
  - ✓ Become familiar with a variety of 3D technologies and instructional tools and be able to implement them in the classroom.
  - ✓ Access and utilize real-time scientific data from various sources and apply them to the study of Earth systems.
  - ✓ Adopt new and innovative inquiry and technology-based teaching and learning strategies.
2. As you implement, the program, collect 'artifacts' that illustrate how you have met your course objectives and passed them on to your students. Artifacts can be in many forms including, but not limited to:
  - *student work samples (such as scanned student writings, posters, or journal entries; video/audio recordings of presentations; photographs of work; etc.)*
  - *digital photographs of students actively engaging in activities*
  - *lesson plans showing how you are incorporating the program into your instruction*
  - *assessments you have created based on the programs*
  - *results of assessments*
  - *PowerPoint presentations created by you for use during class, or by your students*
  - *notes from parents indicating changes they have seen in their children*
  - *letters from supervisors discussing the program implementation*
3. Select the two artifacts that most effectively illustrate that you have met each objective. **You will have a total of 12 artifacts.**
4. Write a brief reflection for each of the 12 artifacts describing why you selected the artifact and what it shows. You may address student learning, comparisons to other curriculum and in particular, pedagogical differences using 3D-VIEW.



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5. Write a 3 page reflective essay that describes how you implemented the program in your classroom, and how the portfolio illustrates successful implementation. Explain how the program affected your own planning and instruction, your content knowledge, as well as your students' learning and success.

### **Option 2: Truncated Electronic Portfolio (possible 30 points)**

Follow the instructions for the Full Electronic Portfolio (above) but complete the portfolio for three of the course objectives, rather than all of them.

### **Option 3: Investigating Earth's Spheres Paper (possible 20 points)**

Construct a 3-5 page paper discussing the importance of teaching Earth science content using the spheres as a foundation. Discuss:

1. Why we teach each sphere (Lithosphere, Hydrosphere, Atmosphere and Biosphere) separately before linking processes within each sphere together. How did this approach affect your own conceptual understanding?
2. How does this approach compare with/complement how you have taught earth science content in the past.
3. Which 'spheres content' do your students struggle with the most? Why?
4. How will you use/are you using Project 3D-VIEW materials to help students to see the connection between the different spheres?

### **Option 4: Current Events Paper (possible 20 points)**

Much of the Earth science content in Project 3D-VIEW can be related to current events. Write a 3-5 page paper indicating:

1. How and why you would make strong connections between the lessons and global current events (occurring within the last 3 years)?
2. Provide 3 examples of current events that would make these connections. Include the following:
  - a. State the title and source of the news article.
  - b. Provide a brief summary of the event.
  - c. Define and discuss the spheres involved and describe the interactions between the spheres exhibited by the current event.



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### Course Grading:

Minimum for graduate credit = 85 points (B)

Minimum for Stipend = 80 points

Final Course Grade	Points Range	Performance Indicators
A	90-100	Participant demonstrates an excellent understanding of Earth's spheres, their interactions and the Earth system. Participant is able to successfully implement inquiry and technology-based teaching and use data to teach science content in the classroom.
B	80-89	Participant demonstrates a good understanding of Earth's spheres, their interactions and the Earth system. Participant is able to successfully implement inquiry and technology-based teaching and use data to teach science content in the classroom.
C	70-79	Participant demonstrates a satisfactory understanding of Earth's spheres, their interactions and the Earth system. Participant is able to successfully implement inquiry and technology-based teaching and use data to teach science content in the classroom.
F	<70	Participant does not meet course objectives.