

NASA's PROJECT 3D-VIEW Graduate Syllabus Summer 2012

All work for Fall 2012 must be submitted by NOV 1, 2012

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 tradeoffs 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.

Course Requirements:

This course is a blended synchronous/asynchronous class. The live class meeting dates are indicated on the course calendar and on the schedule below. Participants are expected to participate in online discussions with their classmates, responding to questions posed by the instructor.

All readings are to be done prior to participating in the discussion (by midnight local time on the Lesson date) or class meeting (live class sessions only) for the week. Assignments must be handed in before midnight on the date specified. Students will be assessed using rubrics. Presentations, projects, and participation in the synchronous and asynchronous portions of the course will be used as tools of evaluation for this course.

Major course assignments are outlined in this syllabus; more detailed information will be provided in class. *Changes may be made to the syllabus to accommodate your learning.*

Plagiarism/improper citation of resources will result in no points awarded for an assignment, and may result in course failure.

This course is graded on a point scale.

A minimum of 60 points must be attempted by September 1, 2012.

All work is due by November 1, 2012

Course Participation:

	Assignment	Maximum Point Value
All participants must complete the mandatory portions of the course and choose from the optional assignments		
Mandatory 1 Due 7/17/12	Data Connections	10
Mandatory 2 Due 7/25/12	Implementation Plan	10
Mandatory 3 Ongoing-See dates for Individual Discussions	Attendance, Participation and Discussion Boards	15
Mandatory 4 Due 8/28/12	Article Review and 3D-VIEW Connections	10
Option 1	Full Electronic Portfolio (highly encouraged)	55
Option 2	Truncated Electronic Portfolio	25
Option 3	Investigating Earth's Sphere's Paper	15
Option 4	Current Events paper	15

Mandatory Assignments (required by all course participants)

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/>

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 and Discussion Boards (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.

Mandatory 4: Article Review and 3D-VIEW Connections (10 points)

After completing your training in the 3D-VIEW Curriculum, review the article from the link below.

Using your knowledge of the Earth's spheres and Earth's Systems, make connections from the article to the 3D-VIEW Curriculum and how you would use the article in your teaching.

http://www.nasa.gov/mission_pages/landsat/news/forest-maps.html

Asynchronous Assignment Options (select the options that help you achieve your goals for the course)

Option 1: Full Electronic Portfolio (possible 55 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:

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.
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 25 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. **You will have a total of 6 artifacts.**

Option 3: Investigating Earth's Spheres Paper (possible 15 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 15 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.

Option 5: National Board Certification Track

As an Endeavor fellow, you have the option of working towards becoming a Nationally Board Certified Teacher with the National Board for Professional Teaching Standards (NBPTS). If you have selected this option with Endeavor staff, you may use the content from this course to develop a Portfolio Entry that meets the course objectives AND the requirements of the National Board portfolio. Successful completion of Option 5 will fulfill the 'optional' requirement for the course. Please submit your work to Karen Woodruff: kwoodruff@us-satelite.net Your Candidate Support Provider is available for guidance.