Professional Development Program

Annenberg/CPB

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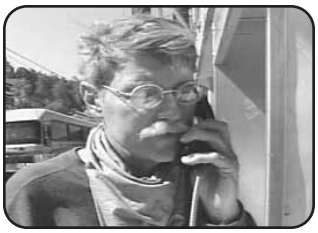

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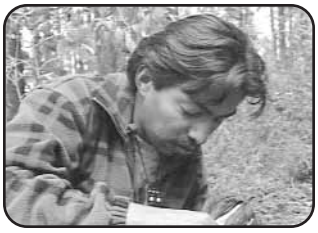

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Overview of the Journey North Workshops

These professional development workshops were created to provide a way to learn about Journey North while exploring science inquiry and other standards-based teaching and learning strategies. The activities in this guide can be used with the four Journey North videos to provide a series of inservice workshops. Facilitators can choose activities to tailor the workshops to focus on different aspects of science teaching including:

- providing an overview of the Journey North investigations,
- exploring best practices in science teaching,
- expanding the use of inquiry-based instruction, and
- incorporating the National Science Education Content Standards into the curriculum.

Workshop/Video Module 1
Introduction to Journey North
The video looks at the three sets of investigations that comprise the Journey North program. Using the video as a springboard, this workshop looks at some of the basic concepts behind the Journey North investigations and explores topics that are important to science teachers.

Suggested and Optional Activities
- How Do You Know It's Spring?
- Using KWL
- Journaling and Using the Challenge Questions
- Reviewing the Standards
- What Is Inquiry?
- Dealing With Wrong Answers
- Tour of Journey North Web Site

Workshop/Video Module 2
Seasonal Migrations: Monarch Butterflies
Although the Journey North program provides opportunities for exploring dozens of different animal migrations, the video focuses on the most popular migration—that of monarch butterflies. Participants use some of the lessons from the Journey North program to learn more about studying migrations, using prediction as an inquiry tool, exploring the Journey North Web site, and correlating the Journey North migrations investigation with their life science curriculum.

Suggested and Optional Activities
- What Do You Know About Monarchs and Migration?
- Predicting the Monarch's Spring Migration Route
- Mapping and Analyzing Monarch Migration Data
- The Annual Cycle, Life Cycle, and Migration of the Monarch
- Correlating to Your Standards
- Migrations Scavenger Hunt
- Journey North Implementation Plan

Workshop/Video Module 3
Plants and the Seasons: Tulip Gardens
The video follows several classes around the country as they explore plant growth and seasonal change through Journey North's International Tulip Study and individual student investigations on plant growth. Participants learn how Journey North integrates process skills into inquiry-based activities and the importance of following a protocol when performing experiments.

Suggested and Optional Activities
- Exploring Where To Plant a Garden To Indicate Spring's Arrival
- Following a Protocol To Control Experiments
- Examining Variables
- Tulips As Tools
- Helping Students Choose a Garden Location

Workshop/Video Module 4
Sunlight and the Seasons: Mystery Class
Journey North's investigation of Sunlight and the Seasons involves students in an 11-week-long hunt known as Mystery Class. The video chronicles students as they track and analyze changes in sunlight in locations north and south of the equator and follow a series of clues to locate the 10 Journey North "Mystery Classes" around the world. Participants learn about this investigation first-hand by taking part in a simulation of the student investigation.

Suggested and Optional Activities
- Thinking About Daylight and the Seasons
- Mystery Class Simulation
- Seeing the Light: What Really Shapes the Web of Life?
- How Do You Teach the Concept of Seasonal Change?

What Is Inquiry?

Much of the research about "best practices" in science education has focused on inquiry-based science instruction. The following essay, from the Exploratorium in San Francisco, provides a clear, concise description of inquiry-based teaching and learning.

A Description of Inquiry

At the Exploratorium Institute for Inquiry, our work in science education is deeply rooted in the belief that human beings are natural inquirers and that inquiry is at the heart of all learning. The work that we do with educators is designed to give them an opportunity to personally experience the process of learning science through inquiry. Our hope is that this experience will stimulate their thinking about how to create classrooms that are supportive environments for children's inquiry.

Inquiry is an approach to learning that involves a process of exploring the natural or material world, that leads to asking questions and making discoveries in the search for new understandings. Inquiry, as it relates to science education, should mirror as closely as possible the enterprise of doing real science.

The inquiry process is driven by one's own curiosity, wonder, interest, or passion to understand an observation or solve a problem.

The process begins by the learner noticing something that intrigues, surprises, or stimulates a question. What is observed often does not make sense in relationship to the learner's previous experience or current understanding.

Action is then taken through continued observing, raising questions, making predictions, testing hypotheses, and creating theories and conceptual models. The learner must find their own idiosyncratic pathway through this process; it is hardly ever a linear progression, but rather more of a back and forth or cyclical series of events.

As the process unfolds, more observations and questions emerge, giving occasion for deeper interaction and relationship with the phenomena—and greater potential for further development of understanding.

Along the way, the inquirer is collecting and recording data, making representations of results and explanations, drawing upon other resources such as books, videos, and colleagues.

Making meaning from the experience requires intermittent reflection, conversations and comparison of findings with others, interpretation of data and observations, and applying new conceptions to other contexts as one attempts to construct new mental frameworks of the world.

Teaching science using the inquiry process requires a fundamental re-examination of the relationship between the teacher and the learner, whereby the teacher becomes a facilitator or guide for the learner's own process of discovery and creating understanding of the world.

For additional information, contact:
Exploratorium
3601 Lyon Street
San Francisco, CA 94123
www.exploratorium.edu/IFI/index.html

Using These Materials

The workshops in this guide follow the order of the modules in the video. The suggested order for the workshops is:

Workshop1: Video Module 1
Introduction to Journey North
Workshop 2: Video Module 2
Seasonal Migrations: Monarch Butterflies
Workshop 3: Video Module 3
Plants and the Seasons: Tulip Gardens
Workshop 4: Video Module 4
Sunlight and the Seasons: Mystery Class

Although the last three workshops may be presented in any order, it is recommended that you show the video module "Introduction to Journey North" before doing any of the other workshops.

Workshop Management

Each module in this guide offers activities for a workshop lasting from one to three hours. There is enough material to provide a series of four (or more) professional development workshops. You can customize the workshops by choosing the modules and activities that best address your needs.

- If you have limited time, you may only want to show the video and discuss some of the questions provided in this guide. Show "Introduction to Journey North" before any of the other video modules.
- If you only have time for a single workshop, show "Introduction to Journey North" and then move on to the activities and video of one of the other three modules. Choose the module that best addresses your learning objectives.

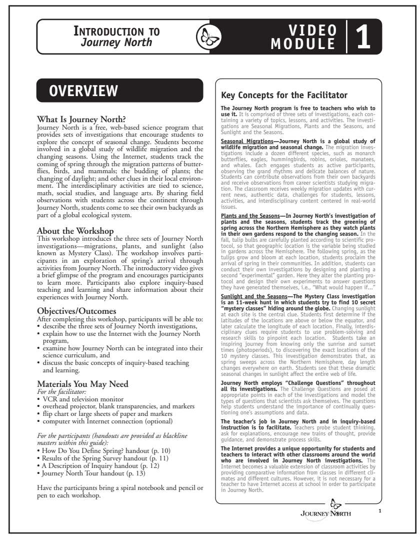
A computer with an Internet connection is recommended, but not required, for the workshops. Instructions for accessing specific pages on the Journey North Web site can be found throughout the guide under the heading "Available on the Web."

The guide includes blackline masters for Journey North handouts and other information needed for the workshop activities.

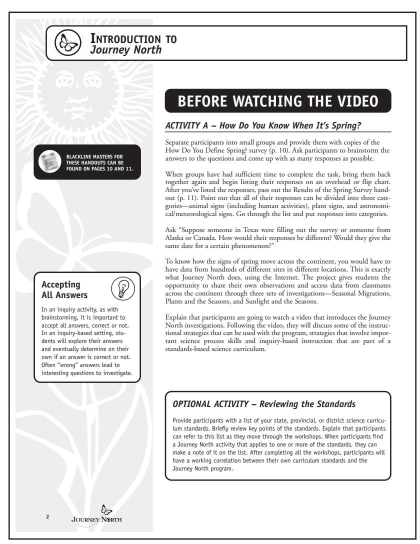
Workshop Guide Format

The information in the guide follows the same basic format for all of the workshops.

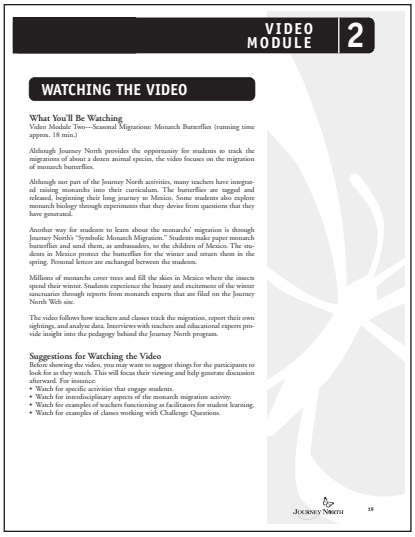
The Overview provides a brief summary of the workshop, objectives, a list of materials that might be needed, and a list of some key concepts that will be helpful to the facilitator.



Before Watching the Video contains a number of workshop activities that can be done before actually viewing the video. The lettered activities are recommended, but a number of optional activities are also provided.



Watching the Video has a summary of the video module, some ideas to help participants focus their viewing, and a list of possible discussion questions about the video. Choose questions that are appropriate for the participants.



VIDEO MODULE 2

WATCHING THE VIDEO

What You'll Be Watching
Video Module Two—Seasonal Migrations: Monarch Butterflies (running time approx. 18 min.)

Although Journey North provides the opportunity for students to track the migrations of about a dozen animal species, the video focuses on the migration of monarch butterflies.

Although not part of the Journey North activities, many teachers have integrated raising monarchs into their curriculum. The butterflies are tagged and released, beginning their long journey to Mexico. Some students also explore monarch biology through experiments that they devise from questions that they have generated.

Another way for students to learn about the monarchs' migration is through Journey North's "Symbolic Monarch Migration." Students make paper monarch butterflies and send them, as ambassadors, to the children of Mexico. The students in Mexico protect the butterflies for the winter and return them in the spring. Personal letters are exchanged between the students.

Millions of monarchs cover trees and fill the skies in Mexico where the insects spend their winter. Students experience the beauty and excitement of the winter sanctuaries through reports from monarch experts that are filed on the Journey North Web site.

The video follows how teachers and classes track the migration, report their own sightings, and analyze data. Interviews with teachers and educational experts provide insight into the pedagogy behind the Journey North program.

Suggestions for Watching the Video
Before showing the video, you may want to suggest things for the participants to look for as they watch. This will focus their viewing and help generate discussion afterward. For instance:
- Watch for specific activities that engage students.
- Watch for interdisciplinary aspects of the monarch migration activity.
- Watch for examples of teachers functioning as facilitators for student learning.
- Watch for examples of classes working with Challenge Questions.

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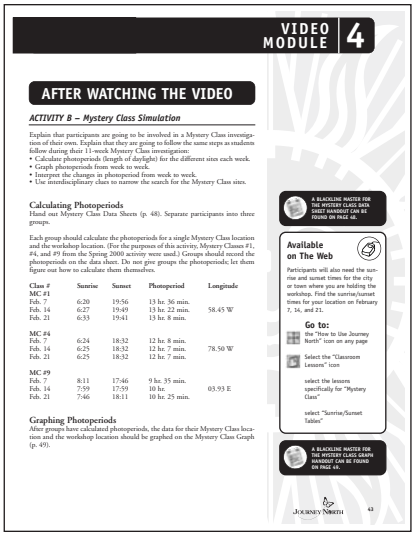
After Watching the Video presents additional workshop activities. Some are extensions or continuations of activities begun before watching the video. Again, the lettered activities are recommended, but optional activities may also meet your needs.



VIDEO MODULE 4

AFTER WATCHING THE VIDEO

ACTIVITY B – Mystery Class Simulation

Explain that participants are going to be involved in a Mystery Class investigation of their own. Explain that they are going to follow the same steps as students follow during their 11-week Mystery Class investigation:
- Calculate photoperiods (length of daylight) for the different sites each week.
- Graph photoperiods from week to week.
- Interpret the changes in photoperiod from week to week.
- Use interdisciplinary clues to narrow the search for the Mystery Class sites.

Calculating Photoperiods
Hand out Mystery Class Data Sheets (p. 48). Separate participants into three groups.

Each group should calculate the photoperiods for a single Mystery Class location and the workshop location. (For the purposes of this activity, Mystery Classes #1, #4, and #9 from the Spring 2000 activity were used.) Groups should record the photoperiods on the data sheet. Do not give groups the photoperiods; let them figure out how to calculate them themselves.

Class #	Sunrise	Sunset	Photoperiod	Longitude
MC #1				
Feb. 7	6:20	19:56	13 hr. 36 min.	
Feb. 14	6:27	19:49	13 hr. 22 min.	58.45 W
Feb. 21	6:33	19:41	13 hr. 8 min.	
MC #4				
Feb. 7	6:24	18:32	12 hr. 8 min.	
Feb. 14	6:25	18:32	12 hr. 7 min.	78.50 W
Feb. 21	6:25	18:32	12 hr. 7 min.	
MC #9				
Feb. 7	8:11	17:46	9 hr. 35 min.	
Feb. 14	7:59	17:59	10 hr.	03.93 E
Feb. 21	7:46	18:11	10 hr. 25 min.	

Graphing Photoperiods
After groups have calculated photoperiods, the data for their Mystery Class location and the workshop location should be graphed on the Mystery Class Graph (p. 49).

A BLACKLINE MASTER FOR THE MYSTERY CLASS DATA SHEET HANDOUT CAN BE FOUND ON PAGE 48.

Available on The Web

Participants will also need the sunrise and sunset times for the city or town where you are holding the workshop. Find the sunrise/sunset times for your location on February 7, 14, and 21.

Go to:
the "How to Use Journey North" icon on any page
Select the "Classroom Lessons" icon
select the lessons specifically for "Mystery Class"
select "Sunrise/Sunset Tables"

A BLACKLINE MASTER FOR THE MYSTERY CLASS GRAPH HANDOUT CAN BE FOUND ON PAGE 49.

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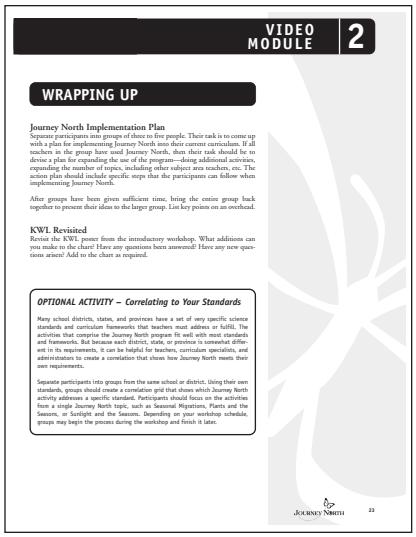
Wrapping Up gives suggestions for closing the workshop. Often, these activities help participants reflect on what they've learned and how to apply the workshop activities in their own classrooms.



VIDEO MODULE 2

WRAPPING UP

Journey North Implementation Plan
Separate participants into groups of three to five people. Their task is to come up with a plan for implementing Journey North into their current curriculum. If all teachers in the group have used Journey North, then their task should be to devise a plan for expanding the use of the program—doing additional activities, expanding the number of topics, including other subject area teachers, etc. The action plan should include specific steps that the participants can follow when implementing Journey North.

After groups have been given sufficient time, bring the entire group back together to present their ideas to the larger group. List key points on an overhead.

KWL Revisited
Revisit the KWL poster from the introductory workshop. What additions can you make to the chart? Have any questions been answered? Have any new questions arisen? Add to the chart as required.

OPTIONAL ACTIVITY – Correlating to Your Standards

Many school districts, states, and provinces have a set of very specific science standards and curriculum frameworks that teachers must address or fulfill. The activities that comprise the Journey North program fit well with most standards and frameworks. But because each district, state, or province is somewhat different in its requirements, it can be helpful for teachers, curriculum specialists, and administrators to create a correlation that shows how Journey North meets their own requirements.

Separate participants into groups from the same school or district. Using their own standards, groups should create a correlation grid that shows which Journey North activity addresses a specific standard. Participants should focus on the activities from a single Journey North topic, such as Seasonal Migrations, Plants and the Seasons, or Sunlight and the Seasons. Depending on your workshop schedule, groups may begin the process during the workshop and finish it later.

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Workshop Tips

Experienced Journey North teachers and staff development professionals provided the following tips to help make your workshops more successful.

TIP: If you have a fairly large number of participants, you may want to have them discuss the video in smaller groups. Provide groups with a list of questions to discuss and a specific time period in which to work. After groups have had time to discuss the questions, bring everyone back together and have each group present highlights of their discussion.

TIP: Pairing experienced teachers with less-experienced teachers can be helpful. Experienced teachers can act as mentors.

TIP: Encourage participants who have used Journey North to share their experiences. They can provide valuable information and tips to participants who are new to the program.

TIP: If you are presenting a workshop that lasts two or more hours, don't forget to include some break time.

TIP: Choose a variety of activities to engage participants. Mix active, hands-on activities with discussions.

TIP: Vary the size and composition of groups so that the same people aren't working together all the time.

TIP: If you are doing a series of workshops with the same participants, keep flip chart/overhead information generated in earlier workshops for reference.

TIP: If you are using technology of any kind—TVs, VCRs, computers, projectors—test the equipment before the workshop to make sure it is set up correctly and works.

TIP: If you are using an Internet connection, bookmark the Web pages you will be using to provide quick access. Depending on which Internet browser you are using, you may also be able to save the pages that you want to use on your computer's hard drive, so you can display them without being connected to the Internet.

TIP: Do any hands-on activities yourself before the workshop so that you know any problems that participants might encounter.

TIP: Preview the video and cue it to the right place before the workshop.

TIP: The icon, right, indicates that the workshop handouts are included as blackline masters in this guide. Copy enough handouts so that each participant gets one, even when working in pairs or small groups.

A BLACKLINE MASTER OF THIS HANDOUT CAN BE FOUND ON PAGE XX.

TIP: Copy each handout on ***both*** sides of the paper. After participants have filled in one side, they will have a blank that they can use as a blackline master for their students.

Correlation to the National Science Education Standards

The following standards are addressed by the Journey North professional development workshops:

Teaching Standards	Module 1 Introduction to Journey North	Module 2 Seasonal Migrations	Module 3 Plants and the Seasons	Module 4 Sunlight and the Seasons
Standard A: Plan an inquiry-based science program	●		●	
Standard B: Facilitate learning	●	●	●	●
Standard C: Engage in ongoing assessment of teaching and student learning	●	●	●	●
Standard D: Design and manage learning environments that provide students with the time, space, and resources needed for learning science	●	●	●	●
Standard E: Develop communities of science learners	●	●	●	●
Professional Development Standards				
Standard A: Learning essential science content through the perspectives and methods of inquiry	●	●	●	●
Standard B: Integrating knowledge of science, learning, pedagogy, and students; applying that knowledge to science teaching	●	●	●	●
Content Standards				
Standard A: Develop abilities to do scientific inquiry	●	●	●	●
Standard B: Develop an understanding of properties of objects and materials, heat and light	●	●	●	●
Standard C: Develop an understanding of the characteristics of organisms, life cycles in organisms, organisms and environments	●	●	●	●
Standard D: Develop an understanding of the properties of earth materials, changes in earth and sky	●	●	●	●
Standard E: Develop an understanding about science and technology	●	●	●	●
Standard F: Develop an understanding of populations, resources, and environments	●	●	●	●
Standard G: Develop an understanding of science as a human endeavor and the nature of science	●	●	●	●