Teachers Guide
Table of Contents

Introduction

Welcome Letter ...................................................................................................................... 2
GoNorth! ............................................................................................................................ 3
Pedagogy .......................................................................................................................... 5
What is Adventure Learning? .......................................................................................... 5
Multidisciplinary Approach .......................................................................................... 5
The Holistic Approach .................................................................................................. 5
Offline-Online ................................................................................................................. 6
Safe and Controlled Collaborative Setting .................................................................. 6
The Collaboration Zones ............................................................................................... 6
Addressing the K-12 Audience ...................................................................................... 7
National Standards ......................................................................................................... 8

GoNorth! Greenland 2010

Program Overview .......................................................................................................... 9
How to Use Curriculum and Activity Guide ............................................................... 10
Module Descriptions ....................................................................................................... 10
Calendar ............................................................................................................................. 11
Module Structure .............................................................................................................. 13
Cover ................................................................................................................................. 13
Module Questions ........................................................................................................... 13
Summary ............................................................................................................................ 13
Three Sections to a Module .......................................................................................... 14
Background Information ............................................................................................... 14
Activities ............................................................................................................................ 14
Case Study ......................................................................................................................... 15
Think Global – Act Local ............................................................................................... 15
Online Chat ....................................................................................................................... 15
Questions for the Team ................................................................................................. 16
Student Page ..................................................................................................................... 16
Teacher Notes ................................................................................................................... 16
References and Resources ............................................................................................. 17
Dear Educator,

Welcome to GoNorth! Greenland 2010 brought to you by the University of Minnesota and NOMADS Online Classroom Expeditions! You and your students are embarking on an incredible journey filled with unique learning opportunities. Explore Greenland’s land and culture.

With the Polar Huskies as your guide, you will investigate the history, people, culture, geography, climate, and ecology of this remote region as we investigate this year’s environmental topic: the ocean and marine resources.

GoNorth! features many interactive components. The 14 week adventure learning expedition integrates the learning environment at PolarHusky.com with the Curriculum & Activity Guide. Media from the trail, expert chats, Collaboration Zones, Q&A with the team, module quizzes and more provide a seamless format to integrate technology in your classroom.

The GoNorth! Curriculum & Activity Guide 2010 is presented in a simple and easy-to-use format. It exists as a comprehensive resource as well as an activity guide. Every three weeks, a new module and its topic is introduced and expanded upon in multidisciplinary activities. Reproducible Student Pages and Teacher Notes make lesson preparation effortless. Each activity is aligned with U.S. National Standards to help meet your national, state, and district educational requirements. The curriculum is designed to be changed and modified as you see fit.

How do you get the Curriculum and Activity Guide? You can view it as a book in a flash-based viewer in the Get Curriculum section of Support at PolarHusky.com. This will also allow you to make notes and share them as well as individual pages with fellow teachers online. Each Module is also available as a PDF file for download in the same section at PolarHusky.com. Last, you can order a printed black and white copy from the Polar Husky store at PolarHusky.com, at the cost of shipping and handling.

Look out! Extreme excitement, authentic learning, and empowered students are coming your way!

The Polar Huskies and Team GoNorth! would like to welcome you to another adventure learning program—an educational adventure of a lifetime.

Think Snow!

Mille Porsild
Program Director and Expedition Leader

Aaron Doering
Education Director
GoNorth!

5 years – 5 Questions – 5 Adventure Learning Expeditions!

GoNorth! is a five-year adventure learning project for the K-12 Classroom anchored in social and natural science curriculum. Utilized by more than three million learners, participation includes teachers in more than 4,200 schools—across the 50 U.S. states and worldwide on six continents.

Over a five-year period—2006 through 2010—our team of educators, scientists, and explorers are dog sledding LIVE to five circumpolar Arctic locations. The 500+ page Curriculum & Activity Guide is developed each year reflecting the expedition’s current Arctic locale and indigenous culture.

The online learning environment at PolarHusky.com delivers comprehensive resources about the region of travel, collaborative opportunities, live field updates, and field research findings synched real-time to the curriculum.

Field research relevant to understanding patterns of climate change include documentation of environmental observations; collection of animal feces in a research effort related to parasite distribution by USDA; collection of snow to survey black carbon in a NSF-funded research effort by University of Washington; and collection of snow cover measurements and crystal samples in a cryosphere research effort by NASA.

GoNorth! Greenland 2010 is a 14-week adventure learning program, taking place February through June 2010 with a 1,000-mile journey dog sledding across the Ice Cap of Greenland—or Kalaallit Nunaat meaning “Land of the People” in the Native language of Kalaallisut.

The Five Questions

Each year GoNorth! seek to explore five central questions:

• What is the Arctic? What makes it unique?
• Who are the Arctic people? What are their traditions and knowledge?
• How do we affect the Arctic, and how does the Arctic ecosystem affect life on Earth?
• What part can we take in protecting the environment and the life of traditional people?
• Will a commitment to sustainability make a difference in our lives?
**GoNorth! Mission**

Committed to furthering adventure learning as an innovative online educational approach to motivate student learning, the purpose of GoNorth! is to embed this approach in the K-12 classroom as a significant online tool to improve geographic, natural and social science literacy for all students.

To build academic excellence while introducing students to Arctic issues and Native perspectives to nurture environmental responsibility, GoNorth! will develop standards-aligned curricula based on the educational approach of adventure learning. Its features will enable teachers to use advanced interactive telecommunications and technology as teaching tools to do the following:

- Provide innovative educational opportunities that excite and inspire youth
- Foster worldwide collaboration on environmental and cultural issues among students and the general public
- Encourage respect, interest, and knowledge of and across cultural boundaries
- Generate environmental understanding, awareness, and stewardship
- Support appreciation of human diversity and traditional values
Pedagogy

GoNorth! is an adventure learning program that provides teachers with a seamless way to incorporate technology and to meet standards while bringing fun and exciting learning activities into the classroom.

What is Adventure Learning?

From the Arctic to Africa and across the nation, the delivery of our adventure learning programs is changing how students learn and teachers teach. Adventure Learning is an educational approach that provides learners with opportunities to explore real-world issues through authentic learning experiences within a collaborative online learning environment.

In today’s classroom, there is a need for developing meaningful learning activities based on the effective use of technology that will support students in problem-solving and applying their acquired knowledge towards real-life issues. Students learn when they are actively engaged with the technology. Excitement and enthusiasm to learn is generated when technology enables the learner to explore and make discoveries. In such an environment the learner is constructing knowledge, which in turn leads to skills that will serve the learner throughout life.

Multidisciplinary Approach

Our multidisciplinary approach uses integrated educational tools specifically designed to complement individual teaching styles and classroom objectives.

Learning is an active process where a learner creates meaning and understanding using newly acquired information combined with his or her previous perceptions. With this theory in mind, modules within the GoNorth! Curriculum & Activity Guide are designed using multidisciplinary, hands on, mind-engaging activities that complement multiple intelligences and individual learning styles. Teachers in both traditional and non-traditional classrooms can use the curriculum effectively by simply adapting the activities according to individual settings.

The Holistic Approach

Bringing together an interactive website and a comprehensive Curriculum & Activity Guide with live expeditions makes GoNorth! a holistic endeavor.

Each module of the curriculum is intertwined with the events on the expedition and reliant upon the interactive nature of the website. Each three-week module topic corresponds with concepts, lessons, activities, and interactive discussions online, as well as conversations, research, and events involving the GoNorth! expedition team members. Events in the field are complemented and reinforced by events in the classroom, each one fueling the other.
Online-Offline

GoNorth! can be used offline as well as online.

For most schools, computer time is limited and the physical realities that affect Internet availability in many classrooms are fairly obvious. Even though the bulk of the GoNorth! experience is online, the entire GoNorth! Curriculum & Activity Guide and many components exist as PDF files that can be easily printed and used at your leisure. Handouts and activity sheets can then be copied for each student. They will immediately engage students in active research, experiments, and other problem-solving activities. Chat transcripts and questions from Basecamp can also be downloaded and used in many facets of the GoNorth!—or your own—curriculum.

Safe and Controlled Collaborative Setting

GoNorth! is an online adventure learning program and the entire website is geared toward the online integration of the GoNorth! Curriculum & Activity Guide, resource pages, collaborations areas, and much more. Students access cutting-edge technology in an interesting, safe, and controlled setting. The Collaboration Zones give students an opportunity to share information with classrooms around the world as they post their own research, ideas, and opinions online. With just the use of a web browser, your classroom will be able to collect and share documents, information, and thoughts. Moderated Chats with content experts, expedition team members, and fellow students highlight current issues.

The Collaboration Zones are a premiere element of our Online Classroom!

The Collaboration Zones enhance learning by letting students interact with the information they are studying, and they allow students to securely collaborate on projects with others.

The essence of the Internet—what we believe makes online education a meaningful tool—is collaboration. Collaboration between students of various races, genders, regions, beliefs, and ages opens the door for cultural, social, and environmental understanding. Being able to easily exchange ideas allows for a greater knowledge and appreciation of each others’ values and opinions. This is the basis for producing respect for the world as a whole. Collaborative forums create authentic learning situations while expanding personal horizons.

During GoNorth! Greenland 2010, students will be able to collaborate in five Zones: the Explore Zone, Culture Zone, Earth Zone, Climate Zone, and the Dog Zone. These zones will all be open for collaborative opportunities throughout the LIVE program.

Every Zone follows the exact same format. Once you know how to work in one (and it should be very straightforward), you will know how to work in them all. To begin, go into the Dog Zone and play around—it’s designed to make everyone comfortable with all of the Zones. And, with every submission you and your students enter a competition for cool prizes!
Addressing the K-12 Audience

Polar Huskies, Arctic adventure, and traditional Native culture enable us to actively engage K-12 students and teachers worldwide.

Delivering comprehensible learning opportunities for students of all ages means presenting information in a developmentally appropriate manner.

3 Levels of Activities: Experience, Explore, and Expand

The words Experience, Explore, and Expand ultimately coincide with the level of complexity in a particular activity. To best understand the organization of content within each Module, refer to these explanations:

1. Experience (K-3): Experience activities introduce students to basic ideas or concepts. Information is sorted and put in an appropriate context. Put simply, these lessons create awareness of a topic or issue. In some instances, students form questions that can be answered in the “Explore” or “Expand” activities. These activities have been developed with K through 3 students in mind.

2. Explore (4-8): Explore activities use “Experience-” related ideas and increase the scale in which they are viewed. Students are required to demonstrate an understanding of a topic as it relates to new systems and larger perspectives. For example, an Experience activity may introduce students to a particular plant or animal, whereas an Explore activity would look at population dynamics, predator/prey interactions, or habitat distribution within an ecosystem. These activities have been developed with grade 4 through 8 students in mind.

3. Expand (9-12): Expand activities take ideas or concepts and relate them to new situations. Students are required to use their previous knowledge and skills to predict, project, manage, relate, or solve a particular question or problem. Extension activities most often involve inquiry-based methodology, cross-curricular research, and real-life applications. These activities have been developed with grade 9 through 12 students in mind.

Activities within each module in the CAAG follow a specific pattern and are delineated by Experience, Explore, and Expand. These terms guide teachers and students to a specific activity that relate to each topic. Similar to Bloom’s taxonomy, Experience, Explore, and Expand allow for the organization of activities that are non-exclusive and appropriate for all ages. A fourth grader could complete an “Expand” activity and a tenth grader could complete an “Experience” activity. Regardless, each activity can be completed on its own or in conjunction with the other three.
National Standards

We are committed to developing educational materials that can be easily integrated in classrooms around the world. At the same time we must meet the needs and graduation requirements within the United States.

The annual GoNorth! Curriculum & Activity Guide is aligned with US National Education Standards.

Using the US National Standards as a reference gives teachers, administrators, and our curriculum writers the ability to communicate in the same language. GoNorth! provides a matrix for each module that classifies each activity within the module and its correlation to the US National Standards. The emphasis of activities in the Curriculum & Activity Guide is rooted in science, social studies, math, geography, technology, and language arts. However, due to the comprehensive nature of multi-disciplinary, cross-curricular education, most activities cover a wide spectrum of topics.

The activities within the GoNorth! Curriculum & Activity Guide are not designed to specifically meet the US National Education Standards. Instead, they provide information that relate to certain benchmarks within the standards. Meeting the specific requirements outlined within the National (and State) Standards is still the job of each individual teacher. We strongly encourage all teachers to modify activities from the GoNorth! CAAG as they best see fit. In doing so, teachers must also realize that required time for these activities could range from a few minutes to a few days.

Meeting standards means documenting work and using various assessment tools. Although guidelines are provided within the GoNorth! Curriculum & Activity Guide, assessing student work must still be completed by the teacher.

To see how specific standards align with each activity, download the alignment grids on each Module page in the Get Curriculum section of Support at PolarHusky.com

How To Read the Alignment Grid — Major and Minor Emphasis

Each activity within the GoNorth! Curriculum & Activity Guide is aligned to the US National Education Standards with an “X” or an “O.” These marks represent our interpretation of the US Standards and their relation to the curriculum.

For each Standard Matrix, an “X” designates an activity that has a “major emphasis” of study or investigation within a particular standard (or benchmark). An “O” represents an activity with an area of “minor” emphasis. “O’s” may also be areas that can be incorporated with more specific, standard-meeting information. For example, educators could expand on many of these activities as a supplement to the lesson and give students information to help meet those specific standards.
GoNorth! Greenland 2010

Program Overview

Similar to our previous adventure learning programs, GoNorth! Greenland 2010 promises to be a notable adventure, taking Team GoNorth!, students, and teachers on an scientific and cultural voyage traversing Greenland.

The northeastern corner of the North American continent, Greenland is the world’s biggest island—three times the size of Texas. This is the land of the people, Kalaallit Nunaat as the Kalaalit, call their land in the native language of Kalaallisut—a land marked by barren rocky islands; majestic fiords; treeless slopes; and towering glaciers at the ocean’s edge calving icebergs splashing into the Arctic Ocean. The giant icecap the covers 85% of Greenland is the perpetrator of the many monstrous icebergs that slough off of Greenland and is the largest ice sheet in the northern hemisphere. It is to this location scientists flock from the entire world to drill for ice cores which aid in understanding climate dating back 400,000 years. The icecap leaves only little land to live on, and the fewer than 57,000 people that live in Greenland are in communities dotted along its coastline. An Inuit people, the ancestors of the Kalaallit walked across the ice on the narrow strait from Ellesmere Island in Nunavut, Canada some 4500 years ago. Thousands of years ago their means of survival was to harvest the plentiful resources of the ocean—and it still is today.

Setting out to explore the ocean and its resources with the Kalaallit, Team GoNorth! will travel with local Greenlandic hunters and their dog teams across the sea ice of the Arctic Ocean to the most northern communities and down the western coast through Baffin Bay. Then, setting out for the two ice-core drilling stations NEEM and SUMMIT, the Polar Huskies will navigate the 1400-lbs komatik sleds across the deeply-furrowed glacial ice of the ice cap, in places more than 11,000 feet (3,350 m) thick. As we journey to almost the very center of Greenland, we will be traveling in the world’s largest national park in our quest to experience the baffling world of ice core drilling first-hand.

The international team on the trail for GoNorth! Greenland 2010 is lead by Mille Porsild (Denmark). Andrea Verdegan (USA) will travel along with Porsild for the entire dogsledding route. GoNorth! Education Director, Dr. Aaron Doering (USA) along with Brant Miller, a Science Education student at the University of Minnesota and earlier 8th grade science teacher will join the team on the trail for the long haul from Thule Air Base to the NEEM Drilling Station. Setting out with Porsild, Christine Germano (Canada) will venture to the communities of Siropaluk, Qannaq, Ilulissat and Uummannaq working with local students on the question “What Is Climate Change to You?”

While the team transmits the adventure worldwide—images, sounds, and voices from the Arctic—learners of all ages will take part and learn as we focus on this year’s environmental issue: the use of earth’s marine resources and oceans and the pursuit of sustainable development.

The slow traverse of Arctic lands enables GoNorth! to actively partake in validation of scientific research on climate change, as we promote and disseminate Arctic natural and social science to the public and in the K-12 classroom while we conduct field work in collaboration with National Science Foundation, NASA and USDA.
How to Use Curriculum and Activity Guide

The GoNorth! Curriculum & Activity Guide 2010 uses traditional knowledge from the native people of the area in which the expedition will travel as well as the experiences of the dogsled expedition as a springboard for interactive learning.

The GoNorth! Curriculum & Activity Guide 2010 consists of four modules:

Module Descriptions

1. Explore: The Arctic
   The human history of science and exploration is underpinned by the skill of observation, not least that compiled in the traditional knowledge of Natives peoples—the world’s first explorers, who adapted to survive on every corner of the planet. An ocean people, Inuit migrating from Canada were the first to settle in Greenland some 4000 years ago. Knowledge passed from generation to generation is at the heart of lifestyle and identity of the Native Kalaallit in Greenland, and has been holding tremendous value to our collective knowledge—not least today in our study of climate change and sustainable development. Chat topic: Arctic exploration.

2. Geology: People
   We are shaped by our environment—and we shape our environment. Our clothing, languages, and customs are all linked to our sense of place. But as we live in a place we change it, and these changes, in turn, influence our culture. This slow flux has taken place throughout human civilization, but since the Industrial Revolution change has accelerated. Today, earth’s climate is changing rapidly, in turn changing places and forcing cultures to adjust expeditiously—as is seen in Greenland, or Kalaallit Nuunaat. An ice cap covers more than 80 percent of Greenland, the world’s biggest island, and sea ice surrounds it for most of any year. These conditions, upon which the people of Greenland have relied and which have shaped their culture, are swiftly changing. Chat topic: The Human Connection

3. Ecology: Sustainable Development
   Each of us uses natural resources in order to provide for our basic needs of food, clothing, and shelter—to say nothing of items like transportation and consumer goods. Sustainable development recognizes these resources as finite and seeks to manage our uses for the long term. Greenland’s diverse coastal ecosystem has experienced both the pitfalls of unchecked resource extraction and some successes in sustainable solutions. By studying the population dynamics and management strategies of Greenland’s marine ecosystems, we gain an understanding of the complex global relationships between humans and our environments. Chat topic: World Resources

4. Climate: Ocean
   Covering about 2/3 the surface of earth, oceans are largely responsible for making earth a livable environment to humans as they regulate climate long-term and provide the world with most of its oxygen. Today ocean temperatures are rising at the same time CO₂ pollution is transforming the chemistry of the ocean making the water more acidic. The most rapid change is taking place in the Arctic’s cold-water regions, leaving its marine environment, such as that of Greenland, in double jeopardy. Oceans are resilient, however, and studying the interplay between earth, ocean and climate, we will explore our role in protecting life in the oceans—and ourselves. Chat topic: Climate Change.
## Calendar

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Module 1 - Exploration: The Arctic

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Module 2 - Ecology: People
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Module Structure

There are four modules to the GoNorth! Curriculum and Activity Guide 2010 (the CAAG).

Each module follows the same structure. It is important to realize that the modules are purposively structured for the educator to either utilize it to its full extent or to easily select parts of the module as it suits the needs of the classroom. The development of the modules is guided by the principle that the content, lessons, and activities will be easily integrated into any classroom and supplement the style of the individual educator.

1. **Cover page.** This page identifies the Module and its title. For example, module one is named “Explore: The Arctic.” A descriptive phrase is written in kalaallitnuna, followed by its meaning in English (below). NOTE: Each module synchs with the LIVE program for a period of three weeks. The curriculum activities, expert chat, Collaboration Zone, Q&A and trail updates all complement the four-weekly module theme.

2. **Module Question.** Each GoNorth! program sets out to investigate an Environmental Question specific to the Arctic locale where the program takes place. This year’s question is “What are the prospects of marine exploration and sustainable development?” Likewise, each module in the CAAG is driven by a Module Question, which relates the focus of the module to the overall Environmental Question. This question is presented to the students on the front page of PolarHusky.com right below the title of the current module. Why we are seeking to answer this question and what need be researched to develop an answer to the question, is presented to the students in a short “Alert” from “WPHO” delivered both in print on page 1 and 2 of the module, as well as online in a movie by the WPHO. Introduce your students to the module topic by watching the movie online in the Explore section of PolarHusky.com!

3. **Summary.** This page is to give you an overview of the module and its contents via a brief description of the module. Four concepts are listed, which are addressed as the focus throughout the activities in the Module. A table of contents also appears on this page. Each activity is listed by number, level, and title. In the left-hand column of this page, find the corresponding trail report, skills used in activities, and national learning standards that are addressed. To find where you are in the module you can refer to the black box in the upper right corner of each page throughout each module.
4. **Three Sections to a Module.** Each module is divided into three sections. “General Knowledge” is the focus of the first section. The second section focuses on “Native Knowledge,” and the last section is a “Case Study,” relating the topic of the module specifically to the area in which the program is taking place. The sections can be used independently or as a scaffold. A Guiding Question guides each section, in the effort to investigate the Module Question.

5. **Background Information.** Do not skip these pages! Each section of the module is introduced with some pages of background information, designed to provide you with the knowledge needed to be confident in working with the content of the activities contained in the module. No further research should be necessary.

6. **Activities.** Each of the three sections in a module contains three activities; one for each of the three levels Experience (K-3), Explore (4-8) and Expand (9-12)—making for a total of nine activities to a module. The black box in the upper right corner displays each activity's number, (module number followed by the activity number). For example the first activity in Module is titled 1-1. Activities with the suffix -1, -2, and -3 always correspond to the General Knowledge section, while -4,-5 and -6 correspond to the Native Knowledge section.

Each activity is guided by a Research Question to answer the Guiding Question for this section, and each activity answers builds on the next. Thus, with slight modifications to make the lesson appropriate for the competence in your classroom, it is an option to teach all three activities as scaffold lessons in your classroom.

The Case Study section follows a slightly different system because all three activities seek to answer the same Research Question and thus do not scaffold to the same extent. The Case Study activities are always numbered with the suffix -1.1, -1.2 and -1.3.
7. **Case Study.** The Case Study seeks to answer the Module Question as it relates to Greenland. The investigation is approached in three parts that can stand alone or scaffold, beginning with the “Fact Finder” that consists of the three activities described above (one for each of the levels Experience, Explore and Expand). This is followed by the parts “Think Global—Act Local” and “Your Voice.”

8. **Think Global – Act Local.** This section of the Case Study presents students and educators with the opportunity to engage in reflection, discussion, and community involvement, both locally and globally. “Think Global” brings the topic into a global perspective, inviting students to conduct research to be posted and shared in the associated Collaboration Zone in the Online Classroom as they join the “public awareness campaign” at PolarHusky.com. The need for students to be encouraged with the ability to make a difference—in particular considering the significance of the topics covered in the Case Study sections—is addressed through activities in “Act Local.” Actions and projects are listed out that students can take both individually and as a class in their local community to make a difference on a global level.

9. **Your Voice.** It is important that students are offered the opportunity to have their voices heard and to become involved in debate, and particularly valuable within a larger community. The last part of the Case Study offers two such opportunities.

**Expert Chat.** Ever listened to a National Public Radio show where listeners are invited to join the conversation with a topic expert? Though the media is a LIVE online chat forum, that is the format of the online chats associated with each module. Offered once a week with start times varying between 10:00 AM to 2:00 PM CST, the chats have proven very valuable and a motivating tool for engaging students of all ages. Background information for the topic along with three thought provoking questions to get the conversation flowing within the classroom and online, is provided within the module as well as online in the Chat section located in Explore at PolarHusky.com.

The chats with topic experts are open for all participating classrooms and are moderated by Education Basecamp to guide the conversation to stay on topic. All that is needed to participate in the chat is a browser. If online access is limited or a scheduling conflict occur, the chat can also take place off-line through a discussion within your individual classroom, using printed transcripts of the chat made available online upon its conclusion. See the calendar online in the Support section of PolarHusky.com for exact schedule.
10. **Questions for the Team.** Students always have questions for the team members regarding their experiences and their way of life on the trail. So this part of the Case Study was developed in order to give students the opportunity to ask their questions…and get them answered! Use this simple and reproducible worksheet to draft questions for the team before sitting down at the computer. Give to individual students or complete as a group. Again, each “Questions for the Team” section corresponds to the module’s focus. Submit the questions in the Q & A section located in Explore at PolarHusky.com by Wednesday of each week, and the questions will be answered the following Friday.

11. **Student Pages.** Student Pages are reproducible worksheets that complement a specific activity. If an activity uses a Student Page, it will be listed under the “Materials” section of that activity. Specific pages will also be referenced in the “Procedure,” so no confusion should occur. The Student Pages appear in order of activity, so everything that is needed for activity 1-1 is first; items for activity 1-2 appear next, etc.

12. **Teacher Notes.** If any extra information or instructions are required to complete a specific activity, they are included in a Teacher Note; or if the page content is to be shared with all students with no need for a Student Page. If a Teacher Note is available for an activity, it will be listed under “Materials” of the activity and referred to in the “Background” or “Procedure” of the activity. Teacher Notes are found with corresponding Student Pages at the end of each module.
13. **Resources.** All of the resources of the module consulted for the development of the activities and information in the background section but not referred to within the text are listed on the last page of each module.