



THE RING OF DARHAD
MONGOLIA WOLVERINE EXPEDITION

LESSON 2: DISCOVER THE DARHAD

LENGTH: 60 MINUTES

GRADES/AGES: GRADES 3-7

Lesson Overview:

Explore northern Mongolia and the Darhad region including its location, topography, and people. Trace the expedition's route on a map, learn about resupply points and compare American culture with Mongolian culture through research.

LEARNING OBJECTIVES

Students will be able to:

1. Locate and identify the Darhad region of Mongolia.
2. Trace the route of the Ring of Darhad expedition.
3. Describe the Darhad region including its topographical features and terrain after exploring the area with pictures.
4. Compare and contrast Mongolia with the United States both physically and culturally.

DIRECTIONS:

1. Locate the Ring of Darhad.

- a. Ask your students to identify the continent where Mongolia is located (Asia) and locate Asia on a map of the world in your classroom or on the **Student World Map**. (Optional: Have students label the continents on the Student World Map.)
- b. After identifying Asia, show your students a map of Asia in your classroom and hand out the **Student Asia Map**. Help your students identify the countries surrounding Mongolia. Have your students mark the location of the Darhad region and label Mongolia, Russia and China on this Student Asia Map. (Optional: Have students label the countries of Asia on the Student Asia Map.)
- c. Have your students look at the **Student Mongolia**

Map. Locate the Darhad region of Hovsgol Province in northern Mongolia.

- d. Distribute the **Darhad Region Map**. Show the class the Ring of Darhad (the ring of mountains surrounding the Darhad Valley that the expedition will be following) using the route on the **Teacher Darhad Region Map**.
- e. Mark both the Ring of Darhad and your hometown on the student World Map.
- f. Using the latitude and longitude from the Mongolia Map, have students estimate the latitude and longitude of the center of the Darhad Valley. Have your students study latitude to discover if the Ring of Darhad is closer or further away from the Equator than your hometown.
- g. Look at the Darhad Region Map again. Tell your students that the mountains that make up the Ring of Darhad range in elevation from 5,000 to 10,000 feet. Explain that elevation measures the height of a point on the Earth's surface by how tall it is compared to sea level. Help your students understand this height by sharing the elevation of your hometown and the highest peak in your state or region.

2. Find the route and resupply points.

- a. Lead your students as they individually plot the Ring of Darhad expedition route on the Darhad Region Map using a colored pencil. Use the Teacher Darhad Region Map to help you guide your students in tracing the route. The expedition will be traveling counter-clockwise around the Ring of Darhad.
- b. As your students are drawing the route, discuss as a class why this route was chosen. Tell your students that wolverines live in rugged, mountainous terrain. The expedition will be following the habitat where wolverines are most likely to be found. Use the background information and videos from Lesson 1 to learn more about the expedition.
- c. Tell your students that they will follow the Ring of Darhad team along this route. Provide each student with one sticky note cut into the shape of an arrow. Place the arrow at the starting location.
- d. Tell your students that on long expeditions, adventurers cannot carry all the food they need at

once. Therefore, they have to have supporters of their mission meet them at designated locations on a specific day with more food. This is called a resupply. Tell your students that it is most effective to designate coordinates for resupply points. However, in this region, the supporting individuals are Mongolians that do not have access to technology including GPS units and satellite phones required for finding the team using coordinates. Instead, the team and resuppliers must find each other using geographical land features. Ask your students to look at the route they just drew. Tell the group that the Ring of Darhad expedition will need three resupplies.

- e. In small groups, have your students identify where they would coordinate resupplies and how they would describe this to those helping the mission.
- f. Share with your students the actual resupply points that will be used by the team and the descriptions given to those meeting them. Have students mark these points on their maps. (Resupply points are noted on the Teacher Darhad Region Map and descriptions and explanations of how the points were chosen can be found in the Background Information.)

NOTE: During this ongoing Ring of Darhad unit, help your students mark where the adventurers are by moving the arrow as the team moves around the region. Check the team's location by visiting www.mongoliaexpedition.com. If this unit is not completed during the actual time the expedition occurs (Spring 2013), you may still "follow" the expedition by using the team's blogs.

3. Travel to the Ring of Darhad through a virtual tour.

Allow students to explore the Darhad region independently, in partners or small groups, or as a class using one of the following methods:

GoogleEarth:

- Download the GoogleEarth Ring of Darhad Route (kmz file) from www.mongoliaexpedition.com.
- Instruct students to zoom in to this area in northern Mongolia using what they learned from the mapping activity.
- Once they have found the Darhad Valley, allow students to explore the topography using GoogleEarth's features and view photographs of the region that were uploaded by other users. Resupply points are marked on this file with descriptions of each point.

Pictures/Video:

- Show your students pictures of the region. (Small images are printed with this lesson; larger images are available at www.mongoliaexpedition.com or search for Mongolia at <http://alpenimage.com/alpen-galleries/>)
- Video images of the region are also in Rebecca Watters' introduction video in Lesson 1.

4. Compare the United States of America to Mongolia.

- a. Tell your students that Mongolia's natural environment shares many similarities to the northern Rocky Mountains of the United States.
- b. Using the **Discovering the Darhad** worksheet, have your students compare and contrast the Darhad region to your hometown. This can be completed:
 - As a class by having students guess the answers and after correction, record the answers you found before the activity, or
 - Individually by having students complete their own research on the region.

NOTE: Mongolia divides provinces into smaller districts known as "sums." These are similar to the USA's counties.

Tips and Modifications:

To adapt this lesson to a different age group, use the following modifications:

- 4.b. Older students can research this information independently or in pairs.

Assessment:

Review student maps for completion and accuracy of required labels.

Review the Discovering the Darhad worksheet for accuracy and completion.

Extending the Learning:

Complete Activity 2 of Lesson 7 of the unit. This activity has students describe a research "expedition" in their schoolyard.

This unit will use feet and miles for measurements. Have students convert measurements throughout the unit to meters and kilometers.

Compare and contrast how this expedition receives its resupplies compared to other expeditions.

Research the mining industry of Mongolia, including ninja miners, and its effects on the environment

(including the wolverine) and the economy.

Study the current events of the region including Mongolia's relationships with China and Russia.

The expedition's resupplies will include the use of reindeer. Research domestic reindeer and how people who live in the region use them.

Learn about the Mongolian Wildlife and Climate Change Project (MWCCP).

PREPARATION:

MATERIALS YOU PROVIDE

- Pencils/colored pencils
- Sticky notes

RESOURCES PROVIDED

Images

- Darhad Region photos (7)

Handouts and Worksheets

- World Map (Student and Teacher versions)
- Asia Map (Student and Teacher versions)
- Mongolia Map (Student and Teacher versions)
- Darhad Region Map (Student and Teacher versions)
- Discovering the Darhad Worksheet

REQUIRED TECHNOLOGY

- Internet Access: Required
- Tech Setup: 1 computer per classroom, projector, speakers and 1 computer per small group
- Plug-Ins: Flash
- GoogleEarth

Other Notes

Complete the Discovering the Darhad worksheet before the activity to help your students compare your hometown to the Darhad region.

Lesson 7 of this unit, Schoolyard Biodiversity Study, provides an opportunity for students to participate in all the steps of the Ring of Darhad Mongolia Wolverine Expedition. This lesson may be completed in portions at the end of the first six lessons to reinforce each lesson's major ideas.

BACKGROUND AND VOCABULARY:

BACKGROUND INFORMATION

To learn more about Mongolia, visit National Geographic's Mongolia page at <http://travel.nationalgeographic.com/travel/countries/mongolia-guide/>

About the Mongolian Wildlife and Climate Change

Project: MWCCP was initiated in 2009 to implement the first study of Mongolian wolverines and other climate-sensitive wildlife. Working in affiliation with the Wolverine Foundation and the Montana State University Bioregions Program, the MWCCP conducts research on poorly known alpine species, works with Mongolian communities to enhance mutual learning about wildlife and conservation, and builds ties between Mongolian and American students and scientists investigating similar species in similar ecosystems in Mongolia and the Yellowstone region. Recognizing that climate change and cross-cultural understanding provide two of the biggest challenges to conservation in the coming century, the MWCCP seeks to build models for effective research, monitoring, and culturally resonant management. You can learn more about wolverines at wolverinefoundation.org, and more about Bioregions Mongolia program at <http://www.montana.edu/bioregions/> To follow on-going wolverine research in Mongolia and the US Rockies, visit the Wolverine Blog at egulo.wordpress.com

About reindeer: The communities in the Darhad are primarily Mongol-speaking herders of sheep, goats, horses, yaks, camels, and cattle; the Tuvan-speaking reindeer folks are a very small minority. Reference Vitebsky, P. 2006 . The Reindeer People: Living with Animals and Spirits in Siberia. Mariner Books. An author interview and book excerpt that references Mongolia are available at: <http://www.npr.org/templates/story/story.php?storyId=5199713>

About the expedition: The Ring of Darhad Mongolia Wolverine Expedition will complete a route of approximately 350 miles. The expedition will travel through what scientific modeling suggests is the most significant block of wolverine habitat in Mongolia. The route will circumnavigate the Darhad Valley and travel through the Sayan and Horidol Sardag mountain ranges. The expedition plans to move for several days at a time and establish camps in areas where these scientists expect increased probabilities of detecting wolverines. The expedition will remain at these camps long enough to survey the surrounding areas in greater detail.

RESUPPLY #1

Resupply point #1 was chosen because of the easy access and location above the tiny town of Renchinlkhumbé. The reindeer herders will simply have

VOCABULARY

Term	Part of Speech	Definition
Coordinates	Noun	The latitude and longitude that define the position of a point on the Earth.
Elevation	Noun	The measurement of a point's height above the level of the sea.
Equator	Noun	An imaginary line around the Earth half way between the north and south poles.
Latitude	Noun	Distance, measured in degrees, north or south from the Equator.
Longitude	Noun	Distance, measured in degrees, east or west from the Prime Meridian .
Prime Meridian	Noun	An imaginary line around the Earth that runs directly through the north and south poles and Greenwich, England.
Resupply	Noun/Verb	The point or act of being provided with new supplies including food and fuel during an expedition or trip.
Route	Noun	A road, course, or way for travel from one place to another.

to follow the main river out of town and will intersect the expedition's route about 20 miles and a thousand feet in elevation above the town.

RESUPPLY #2

Resupply point #2 will be one of the most difficult for the reindeer herders to find. This is in a very remote location and the expedition will need several contingencies to be sure they meet their resupply. The expedition has chosen this valley because this is where the main river flows. The expedition will tell their resuppliers to go upstream from where the river turns to the east. The expedition will likely descend as well, hoping to meet the resuppliers somewhere between the elevation of their route and the river valley.

RESUPPLY #3

Resupply point #3 was chosen for several reasons. First, the expedition anticipates that they will need small rafts called "packrafts" to ferry themselves across the

river. To avoid carrying the extra weight of these rafts, the expedition will have them arrive in the resupply. Also, there is a cabin here that is owned by Boojum Expeditions in Bozeman, Montana. The group has helped the expedition organize logistics in the region and the permanent structure will allow the team to have a defined meeting point.

Prior Knowledge

Basic information about the Ring of Darhad Mongolia Wolverine Expedition and team members

Recommended Prior Activities

Lesson 1 of Ring of Darhad unit: Meet the Team

Images of Mongolia

ALL PHOTOS COURTESY OF GORDON WILTSIE.
SEE ORIGINAL IMAGES AT
[HTTP://ALPENIMAGE.COM/ALPEN-GALLERIES/](http://alpenimage.com/alpen-galleries/)



Darhad Valley herder moves around her sheep, yaks and cattle below the Horidol Saridag Mountains.



Horidol Saridag Mts. Riders atop Utreg Pass during annual migration from Darhad Valley to Lake Hovsgol.



West shore of Lake Hovsgol, with a nomadic family's winter camp below the slopes of Horidol Saridag Mountains.



Darhad Valley. Fall-colored larch forest in front of Horidol Saridag Mountains.



Horidol Saridag Mountains.



Darhad Valley. A herder tends his flocks next to Dood Nuur lake.



Darhad Valley. Yaks cross river below Horidol Saridog Mts.



Name: _____

DISCOVERING THE DARHAD

Compare and contrast your hometown to the Darhad region of northern Mongolia by completing the following table using information about your hometown.

	Darhad Region, Hovsgol (Khövsgöl) Province, Mongolia	Your Hometown: Your State: U.S.A.
County (USA) or District/Sum (Mongolia)	Renchinlkhümbe	
Latitude	51° to 52°N	
Longitude	98° to 100°E	
Elevation	5,000 – 10,000 feet	
Topography	Part of largest mountain range in Mongolia	
Bordering countries	Russia, China	
Climate zone	Northern Hemisphere temperate zone	
Average April low temperature	11.8 F (–11.2 C)	
Average April high temperature	38.1 F (3.4 C)	
Common animal species	Elk, brown bear, wolverine, ermine, sable, moose, Siberian weasel, Siberian ibex, musk deer, roe deer, wild reindeer, wolves, red fox, Siberian mole, and red squirrel	
County/Sum population size	4,284	
Official language	Mongolian	
Time zone	UTC +7 to +8	
Currency	Togrog/Tugrik	
Traditional house	Ger (or yurt)	
Economic industry	Herding, agriculture, and mining	
Most common sports	Horse racing, archery, and Mongolian wrestling	
Years of school for children	11	
Life expectancy	65 years	

Sources:

<http://travel.nationalgeographic.com/travel/countries/mongolia-guide/>
<http://www.discovermongolia.mn/>
<http://en.wikipedia.org/wiki/Mongolia>

http://en.wikipedia.org/wiki/Renchinlkh%C3%BCmbe,_Kh%C3%B6vsg%C3%B6l
<http://www.e-mongol.com/mongolia-environnement.htm>
<http://worldwildlife.org/ecoregions/pa0519>



MONTANA NSF
EPSCoR



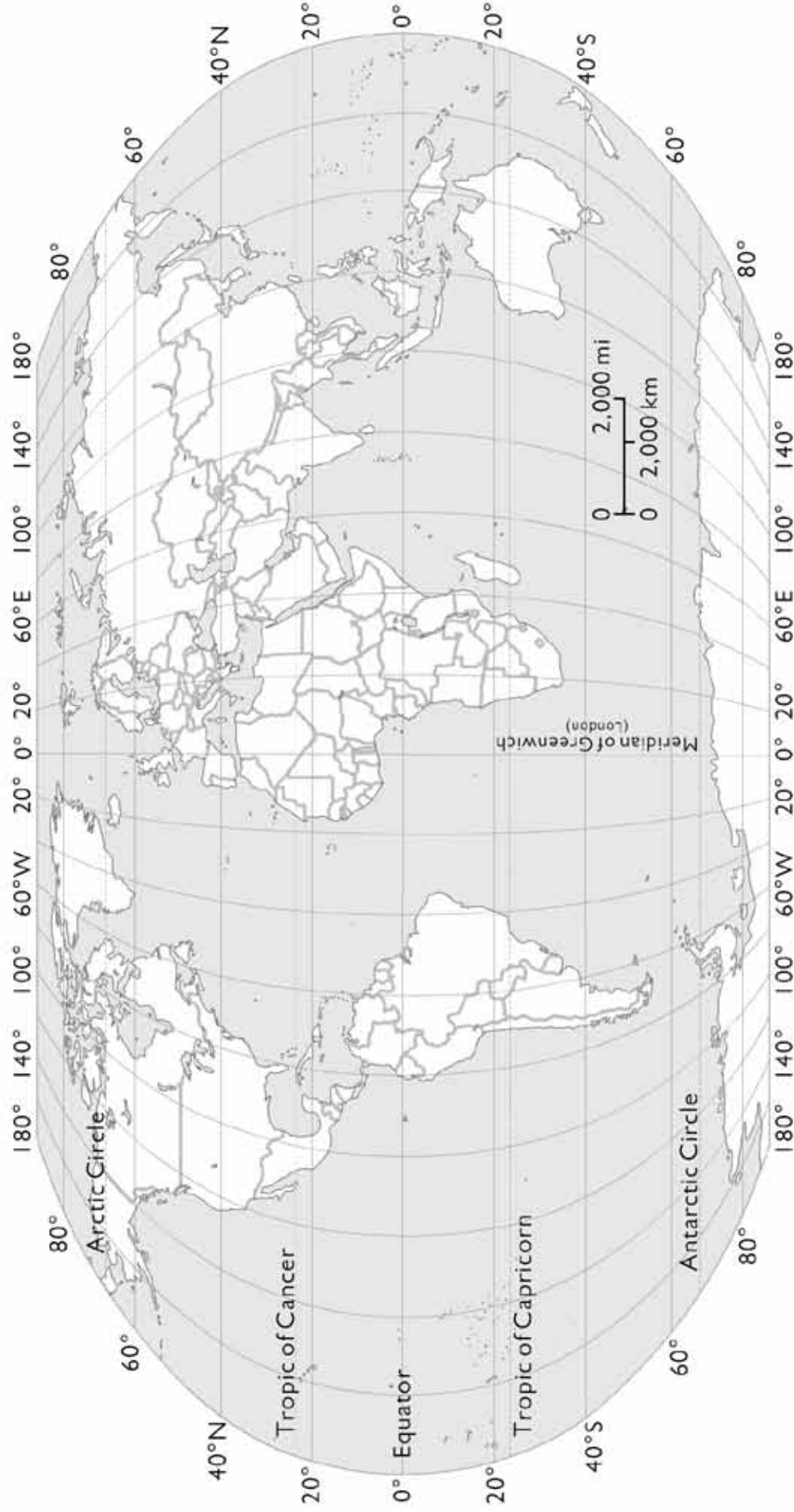
MONTANA
STATE UNIVERSITY

EXTENDED
UNIVERSITY



Name: _____

WORLD MAP

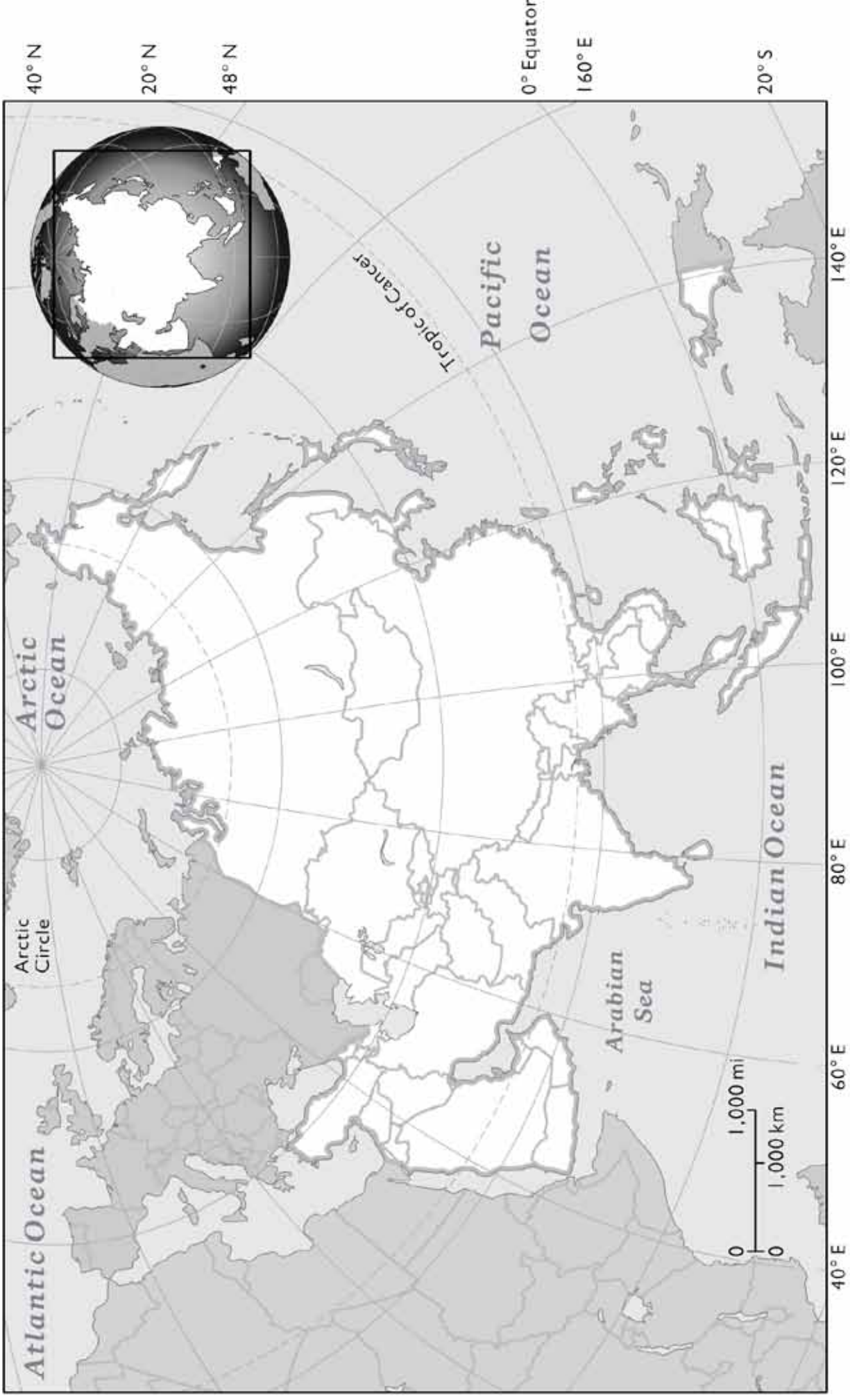


TEACHER WORLD MAP



ASIA MAP

Name: _____



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ASIA

TEACHER ASIA MAP



Name: _____

MONGOLIA MAP



TEACHER MONGOLIA MAP

Name: _____

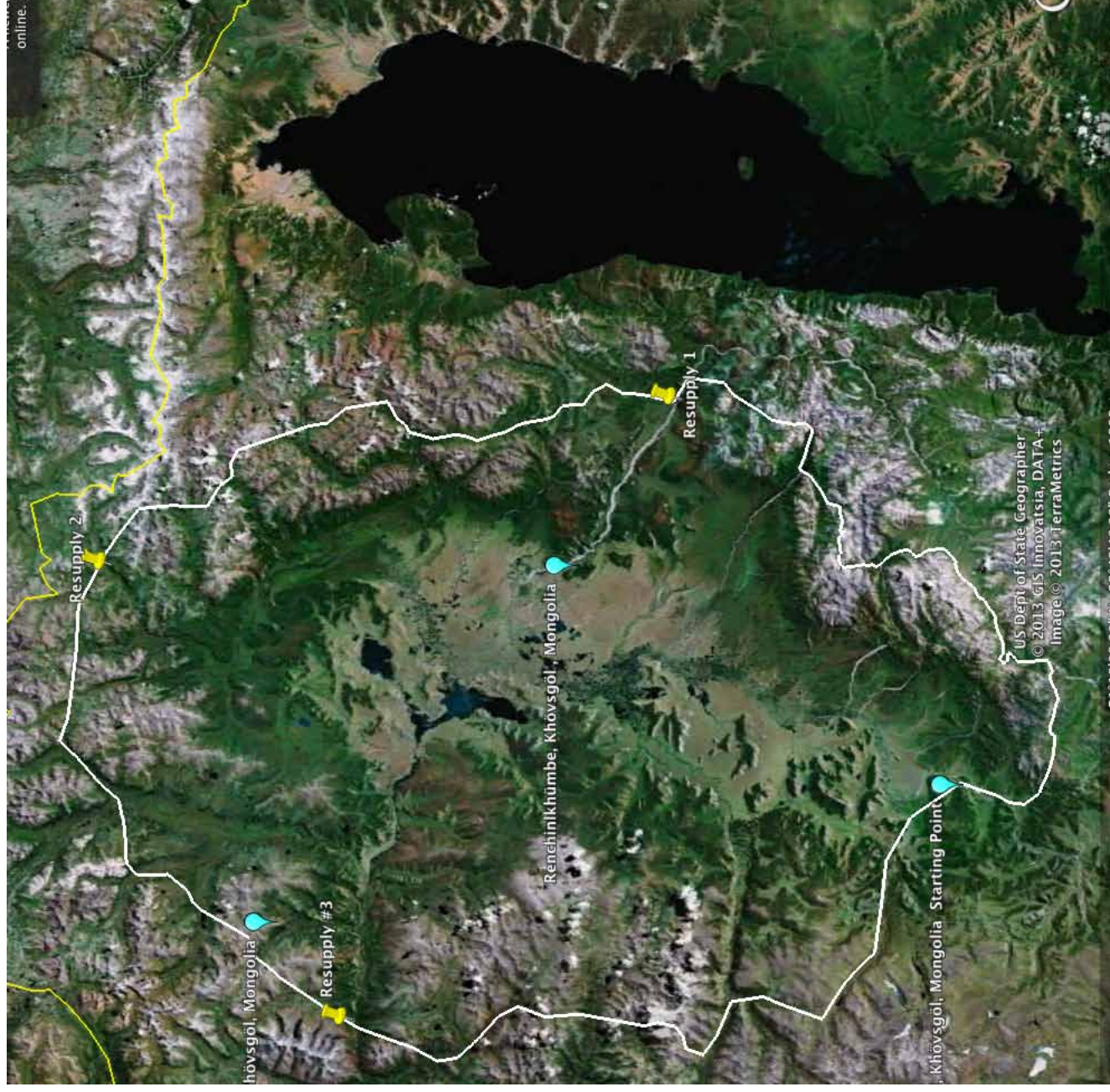


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RING OF DARHAD MAP



TEACHER RING OF DARHAD MAP



Resupply 1: This Resupply Point was chosen because of the easy access and location above the tiny town of Rēnehinkhūmbe. The reindeer herders will simply have to follow the main river out of town and will intersect our route about 20 miles and a thousand feet above the town.

Resupply 2: This will be one of the most difficult for the reindeer herders to find. This is in a very remote location and we will need several contingencies to be sure we meet our resupply. We have chosen this valley because this is where the main river flows. It will be possible to show this river to the coordinators with whom we are working in the Darhad Valley and they will follow the river upstream until they find us. We will likely descend as well, hoping to meet somewhere in the middle. Our directions will be to go upstream from where the river turns to the east.

Resupply 3. This Resupply Point was chosen for several reasons. First, we are anticipating that we will need small rafts called "packrafts" to ferry ourselves across the river. To avoid carrying the extra weight of these rafts, we will have them arrive in the resupply. Also, there is a cabin here that is owned by Boojum Expeditions in Bozeman, MT. The group has helped us organize logistics in the region and the permanent structure will allow us to have a defined meeting place.