

Project G.L.A.D.
Forest Grove School District
GEOGRAPHIC REPRESENTATIONS
Idea Pages

I. Unit Theme

This geography unit is designed for upper elementary, middle school, and high school students. “Geographic Representations” deals with the various ways that information about our world can be displayed or represented geographically. The most important theme of the unit is that almost all information about our world can be displayed geographically through the use of maps. This unit is a component of a larger introductory unit on Geography in general.

II. Focus/Motivation

- Inquiry charts- on students’ prior knowledge about maps and geography.
- Observation charts-Posted on wall with various picture file cards to generate questions.
- Direct experiences-Making “mental maps” and “peeling the world” with an orange to actually see map distortion.
- Realia (Globes, different types of maps, charts, photographs, and satellite images)
- Read aloud – “The Great Map Controversy” narrative as well as other books listed in Bibliography.
- Signal words-Projection, Contour, Landform, Global Grid, Geography, Topography
- Picture file cards-maps, photos, charts, satellite images, diagrams all relating to the idea of representing the information about the world geographically.

III. Closure/Evaluation

- Action plans-Which map projection should the school adopt?
- Process charts and learning logs-Keep track of when you are thinking “geographically”
- Performance Assessment-Making maps of the school, 3-D salt maps of imaginary lands or local community. Maps of the neighborhood, home.

The evaluation piece of this unit has two components. The first is a learning log entry where students pick one of the map projections they have learned about and write a short persuasive essay about which projection of the world they prefer and why. In this writing they will explain the characteristics of their favorite projection as well as point out characteristics of the other projections that for whatever reason they see as being less important. The second part of the final evaluation is the creation of a 3-D salt map. Students will need to demonstrate their understanding of the vocabulary of the unit as well as key concepts through their map.

IV. Concepts/Understandings

Concepts and understandings addressed through this unit include:

- Advantages and disadvantages of different map projections.
- Maps vs. Globes
- What maps show (size, shape, direction, distance)
- Physical vs. political maps.
- How to read maps.
- Using Atlases and Almanacs.
- Using cartograms, graphs, and charts.
- Physical features, landform terminology and identification.
- Contour and contour lines to depict topography.
- The global grid/Using latitude and longitude to find absolute locations.

V. Vocabulary

projection	cartogram	topography	legend
elevation	scale	graph	climate
latitude	longitude	parallel	meridian
equator	prime meridian	hemisphere	contour
river	ocean	bay	gulf
basin	mesa	plateau	archipelago
island	isthmus	strait	plain
relative size	relative shape	relative direction	relative distance
thematic map	river system	lake	sea
geography	contour line	contour interval	peninsula

VI. Reading/Writing skills (From the Oregon State Standards for the CIM)

Reading

- Students will identify or summarize a statement or sentence indicating the main idea of the selection.
- Students will identify or summarize details such as key words, phrases, or sentences that explicitly state important characteristics, circumstances, or similarities and differences in characters, times, or places.
- Students will extend and deepen comprehension by relating text to other texts, experiences, issues, and events.

Writing

- Students will convey clear, focused main ideas supported by accurate and relevant details in ways appropriate to topic, audience, and purpose.
- Students will use and vary sentence structures and lengths to enhance flow, rhythm, meaning, and clarity.

VII. Social Studies Skills (From the Oregon State Standards for the CIM)

- The student will understand and use geographic information using a variety of scales, patterns of distribution, and arrangement.
- The student will understand the advantages and disadvantages of using various geographic representations to depict and solve geographic problems.
- The student will interpret and evaluate information using complex geographic representations.
- The student will use a variety of geographic representations to analyze information and draw conclusions about geographic issues.

VIII. Resources and Materials

Teacher resources:

Drawing the Line: Tales of Maps and Carto-Controversy. Mark Monmonier, Henry Holt & Company, 1995.

Why in the World? Adventures in Geography. George Demko, Anchor Books, 1992.

The Book of Where: Or How to be Naturally Geographic. Neill Bell, Scholastic, 1982.

Student Books:

Maps and Charts, Pam Beasant and Alastair Smith, Usborne 1993

Maps: Getting From Here To There, Harvey Weiss, Houghton Mifflin Co., 1991

Mapping the World, Sylvia A. Johnson, Simon & Schuster, 1999

The Book of Where, Neill Bell, Scholastics Inc., 1994

Where Am I?, A.G. Smith, Stoddart, 1997

Marvelous Meaningful Maps, Madelyn Wood Carlisle, Barron's Educational Series, Inc., 1992

Maps and Globes. Jack Knowlton & Harriet Barton, HarperCollins Publishers, 1985.

Me on the Map. Joan Sweeney, Dragonfly Books, 1996.

Blast off to Earth: A Look at Geography. Loreen Leedy, Holiday House, 1992.

Spanish books

Los mapas del mundo, Robert Coupe, Shortland, 1999

Los mapas, Chris Jaeggi, Rand McNally, 1995

Forest Grove School District
Project GLAD
GEOGRAPHIC REPRESENTATIONS
Unit Planning Pages

I. FOCUSING/ MOTIVATION

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- Picture file cards-maps, photos, charts, satellite images, diagrams all relating to the idea of representing the information about the world geographically.

II. INPUT

- Pictorial input charts: 3-D vs. “Top down” physical map with map terminology included.
- Graphic organizers-“Which map is best for Classroom Use?” organizer as primer for mini-debate.
- Realia-Same as above.
- Demonstrations/explorations-“Mapping Your Bedroom” to learn scale.
- Narrative input-“The Great Map Controversy”
- Comparative input charts-Mercator vs. Peters Projection maps.

III. GUIDED ORAL PRACTICE

- Poetry/chanting-Five chants/songs to reinforce concepts.
- Sentence Patterning (Farmer-in-the-Dell) chart-Use vocabulary from unit (map terms, landforms)
- Process Grid-“How do different types of maps compare?”
- Home-school connections-Who uses maps? How are they useful? What is the most important thing a map can show?

1V. READING/WRITING ACTIVITIES

- A. Total Class Modeling
- Total class modeling of reading and writing-“Letter to the National Geographic Society; what should be the official projection?”
- B. Small group – Cooperative Tasks –Variety of Groupings:
Flexible, Heterogeneous, and Need and Choice
- Ear-to-ear reading-read aloud books, sections of textbook.
 - Mind-mapping- To answer questions: What are maps good for? Uses for maps?
 - Big Books – *Who said the Earth isn’t Flat?* book about flat maps.
- C. Individual Practice and Choice:
Reading/ Writing Using Student’s Own Language
- Silent Sustained Reading-Stories about how maps were created/used.
 - Silent Sustained Writing-Writing about which maps are most interesting, useful.
 - Reading/Writing to all genres, domains-Cinquain poems using unit vocabulary.
 - Journals, Logs, Mind-mapping-Journal entries in response to end of lesson, reflective prompts.

V. EXTENDED ACTIVITIES FOR INTEGRATION

- Music/movement-“Sing” some of the chants set to song lyrics and develop choreography.
- Poetry-Write original poems about maps and experiences with them.
- Art-Mapmaking.
- Field trips-Trips outside of the building to visualize a 3-D environment on paper. (They draw a topo map while looking at something that is three-dimensional.)

VI. CLOSURE/EVALUATION

- Action plans-Which map projection should the school adopt?
- Process charts and learning logs-Keep track of when you are thinking “geographically”
- Performance Assessment-Making maps of the school, 3-D salt maps of imaginary lands or local community. Maps of the neighborhood, home,

Narrative Input Text

The Great Map Controversy

Adapted from, Where Am I? The Story of Maps and Navigation

By A.G. Smith

It all started in the 16th century in the country of Belgium, in Europe. Europeans needed a new map. Gerhardus Mercator, born in Flanders in 1512, studied philosophy, mathematics, and astronomy at the University of Louvain, and also learned the arts of engraving and instrument making. His first important work was a very detailed map of Flanders. Mercator's work was of such high quality that Emperor Charles V commissioned him to make a *terrestrial globe*, which he completed in 1541.

Later he moved to Duisberg, Germany, where he became cartographer to the Duke of Cleves. He also began publishing maps and produced the first modern maps of Europe and Britain. Mercator soon realized that what the world needed was a really good chart for navigation.

Early navigators found it difficult to lay out their courses on a chart because charts made no allowances for the roundness of the Earth. The meridians of longitude converge at the poles like the slices of an orange. How could a segment be laid out flat so that a sailor could plot his compass course with a straight line?

Gerhardus Mercator found the answer. His solution was to lay out the segments on a flat surface and, treating them as if they were elastic, stretch the tops of the segments until they met. The segments nearest the poles stretched the most. Greenland became huge. The sections between the tropics, where most of the navigation was done, stretched the least. Each segment became a rectangle and was laid out beside the others to form a large world map. Parallel lines of latitude crossed the meridians of longitude to form a grid. A navigator could then draw his compass course in a straight line on a flat chart. In 1569, Mercator published his history-making world map. Today most deep-sea navigation is still done on charts that use the Mercator projection.

Hundreds of years later, in 1974, another map projection was announced. This map, called the Peters projection, was created as a critique of the Mercator projection map. The German historian and professor Arno Peters made the map because he felt the distortion of the Mercator projection discriminated against the peoples of the Southern hemisphere. He pointed out that the Mercator projection makes Europe, Greenland, Northern Asia, and North America appear bigger than South America, Africa, and Australia. In actuality, Africa is bigger in size than both Europe and North America. He claimed that his map was fair to all peoples of the world because it represented the relative size of the continents accurately in relationship to each other. That is why the Peters projection is considered an *equal-area* projection. Many agreed with him and called for the use of the new map in offices, classrooms, and libraries around the country.

But many other cartographers disliked both the map and the man who “created” it. For one, there had been a map in existence since 1885 that was identical in projection to the Peters map, called Gall’s projection. Cartographers were upset that Arno Peters would try to claim credit for a map projection that was already in existence when he said that he alone created it. But what really bothered cartographers was the Peters map itself. Of the four things that maps show -- size, shape, direction, and distance -- the Peters map only showed one of them well: size. The other four attributes were inaccurate on a Peters map. Just look at the shape of the continents in the Southern hemisphere, they are stretched too long from top to bottom while landmasses in the North looked smashed down from above.

People still disagree about which projection is best, especially for schoolrooms. Many school districts and mapmakers, like the National Geographic Society, have decided that the Robinson projection is better for students to view the world, since both the Mercator and Peters are both so distorted. The Robinson projection has minimal distortions, nothing like those of the Mercator and Peters. But whatever map projection people choose to look at, they need to remember the purpose for the map. Mercator’s map was originally meant for ocean navigators, not school children. And if you want to actually *see* which continent is the biggest size-wise on a map, the Peters map is a good choice. People need to remember that every map is a compromise, since it involves a projection from the round globe to a flat surface.

Narrative Input Chart: teacher information

The Great Map Controversy

Vocabulary to be introduced first:

projection	navigator
cartography\ cartographer	lines of latitude & longitude
terrestrial globe	critique

Panel #1- 15th century female figure: It all started in the 15-century in Europe. Europeans needed a new map.

Panel#1- Gerhardus M. figure: Gerhardus Mercator, born in Flanders, Belgium in 1512, studied philosophy, mathematics, and astronomy at the University of Louvain, and also learned the arts of engraving and instrument making. His first important work was a very detailed map of Flanders.

Panel#1- Globe: Mercator's work was of such high quality that Emperor Charles V commissioned him to make a terrestrial globe, which he completed in 1541

Panel#2- Duke: (Move Mercator figure to panel#2) Later Mercator moved to Duisberg, Germany where he became cartographer to the Duke of Cleves.

Panel #2- Map: (Image of Mercator's original) Mercator also began publishing maps and produced the first modern maps of Europe and Britain.

Panel #3- Navigator: Mercator soon realized that the world needed a really good chart for navigation. Early navigators found it difficult to lay out their courses on a chart because charts made no allowances for the roundness of the Earth.

Panel #3- Orange peel image: The meridians of longitude converge at the poles like the slices of an orange. How could a line segment be laid out flat so that a sailor could plot his compass course with a straight line?

Panel #3- Greenland Distortion Piece. Gerhadus Mercator found the answer. His solution was to lay out the segments on a flat surface and, treating them as if they were elastic, stretch the tops of the segments until they met. The segments nearest the poles stretched the most. Greenland became huge.

Panel #3- Mercator Projection Map. The section between the tropics, where most of the navigation was done, stretched the least. Each segment became a rectangle and was laid out besides the others to form a large world map. Parallel lines of latitude crossed the meridians of longitude to form a grid.

Panel #3- *Compass*: (place compass on map and demonstrate after reading piece) A navigator could then draw his compass course in a straight line on a flat chart. In 1569 Mercator published his history making world map. Today most deep-sea navigation is still done on charts that use the Mercator projection.

Panel #4- *Arno Peters*: Hundreds of years later in 1974, another map projection was announced. This map, called the Gall-Peters projection, was created as a critique of the Mercator projection map. The German Historian and professor Arno Peters, made the map because he felt the distortion of the Mercator projection discriminated against the peoples of the southern hemisphere.

Panel #4- *Map-Gall/Peters projection*: He pointed out that the Mercator projection makes Europe, Greenland, North Asia, and North America appear bigger than South America, Africa, and Australia. In actuality, Africa is bigger in size than both Europe and North America. He claimed that his map was fair to all peoples of the world because it represented the relative size of the continents accurately in relationship to each other. That is why the Peter's projection is called an "equal-area" projection. Many agreed with him and called for the use of the new map in offices, classrooms, and libraries around the country.

Panel #5- *Talk bubble-controversy*: But many other cartographers disliked both the map and the man who "created" it. For one there had been a map in existence since 1885 that was identical in projection to the Peters map, called Gall's projection. Cartographers were upset that Arno Peters would try to claim credit for a map projection that was already in existence when he said that he alone created it.

Panel #6- *Talk bubble-four things*: But what really bothered cartographers was the Peter's map itself. Of the four things that maps show-size, shape, direction, and distance – the Peter's map showed one of them well: size. The other four attributes were inaccurate on a Peter's map. (After reading the following sentence point back to the Peter's map on previous piece) Just look at the shape of the continents in the Southern hemisphere, they are stretched too long from the bottom while landmasses in the North look smashed down from above.

Panel #7- *Children*: No text here, just put children in place on background.

Panel #7- *Teacher*: People still disagree about which projection is best, especially for schoolrooms.

Panel #7- *National Geo Poster*: Many school districts and mapmakers, like the National Geographic Society have decided that the Robinson projection is better for students to view the world, since both the Mercator and the Peters are both so distorted.

Panel #7- *Robinson projection map*: The Robinson Projection has minimal distortions, nothing like those of the Mercator and Peters. But whatever map projection people choose to look at, they need to remember the purpose for the map. Mercator's map was

originally made for navigators not school children. And if you want to actually see which continent is the biggest size wise on a map Peters map is a good choice. People need to remember that every map is a compromise, since it involves a projection from the round globe to flat surface.

WHO SAID THE EARTH WASN'T FLAT?

By Bre Bartels

Maps and Diagrams allow us to represent a spherical shape on a flat surface.

The Earth isn't really flat, but maps, charts and diagrams are compact, flat representations of the round Earth. Since it is easier to carry a map in your pocket than a globe, mapmakers, or *cartographers*, draw two-dimensional pictures of the three-dimensional sphere of the Earth. Through the ages, cartographers' techniques have changed and maps have become more sophisticated. Early maps took a long time to make and were drawn by hand with precision instruments. Modern maps are created through the use of aerial and satellite imaging along with the help of computers, and are much more accurate.

Cartographers use advanced technology to create maps and diagrams that project a round earth on flat paper.

Lines of latitude and longitude help us locate places on both maps and globes.

Lines of latitude and longitude are imaginary lines that form a grid covering the whole globe. This grid helps people find locations of places throughout the world. Lines of latitude like the Equator run east to west around the globe. Lines of longitude, like the Prime Meridian, run north to south, meeting at the poles. When put together, latitude and longitude lines form a grid. Every place on earth has a unique position on this grid, like a street address in your hometown. Lines of latitude are sometimes called parallels, while lines of longitude are sometimes called meridians.

Parallels and meridians allow us to locate places accurately on both flat maps and globes.

Cartographers make maps using different projections to vary the way we look at the Earth's surface.

No map is a perfect re-creation of the Earth. That is because when you flatten a round, three-dimensional object its surface becomes distorted, especially at the top and bottom. For this reason, many maps have the most distortion at the poles. Maps have different **projections**, changing the way the Earth looks on a flat surface, depending on what the map is trying to display.

All maps show four things: **size, shape, direction, and distance**. **Size** refers to how big objects are in relationship to each other on a map and in the real world. **Shape** refers to how well the map re-creates the actual shape of objects on a map compared to what they look like in real life. **Direction** refers to how accurately directions are re-created on the map. If you follow a line on the map to your desired destination will you actually get there in the real world? **Distance** refers to whether or not the map does a good job at accurately showing the viewer just how far places are from each other.

Every map is a compromise, since it involves a projection from the round globe to a flat surface.

Cartographers and Geographers use maps, charts, and diagrams to display geographic information in many different ways.

Maps come in various shapes, sizes, and purposes. A map can be as simple as directions to a friend's house and as complex as an aeronautical chart guiding a pilot safely to an airport. Maps can display information about the land itself, a **physical map**, or it can display information about the people living there, a **political** or **cultural map**.

Geographers study and analyze maps to make informed decisions about what is going on in our world. Geographers look for patterns as well as possible causes and consequences of the information they gather. Take for example the relationship shown here between nighttime satellite photos in Mexico City and the population data from the same location. What is the connection?

Geographers analyze different maps and diagrams to explain patterns and solve potential problems in our world.

Cartographers use scale to accurately re-create distances from the globe onto a smaller flat surface.

Because the world is so big and maps are so small in comparison, geographers use a distance tool called “scale”. The scale tells you the relationship between distances on a map to distances in real life. A large scale map of 1”=1 mile means that for every inch you travel with your finger on the map, you travel 1 mile in the “real world”, showing you a very close-up view of that place. On the other hand, a small scale map where 1”=1000 miles would show you a much larger surface area, but in much less detail.

“Scale” helps cartographers accurately re-create distances from the globe onto a smaller flat surface.

Legends, keys, and contour lines help geographers represent details from the real world onto a map.

Legends or keys are small diagrams that decode the many symbols you may find on a map or chart. Legends explain many geographic features like lakes, roads, and sometimes contour. Contour, or the shape of the land, is represented through color changes or contour lines. The closer the lines are, the steeper the slope; the further apart, the more gentle or gradual is the increase in elevation.

Contour lines allow us to “see” the shape of the land even though we are looking at a flat map.

Maps, diagrams, and charts allow us to look at the earth’s surface in many different ways. They are flat representations of a round object, and therefore are not perfect representations of the real world. But they can show us patterns, and make us think about what is going on in our world, especially with advanced, modern maps. Maps give us a unique picture of our world as well as our place in it. What would we do without maps?

Chants

CONTINENTS HERE, CONTINENTS THERE

By Laura Curry

Continents here, continents there,
The world has continents everywhere!

Seven continents around the globe,
Seven continents across the map.
Remember that a globe of the world is round,
Remember that a map of the world is flat.

Continents here, continents there,
The world has continents everywhere!

North America and Europe are in the north,
And Asia is mostly in the north, it's true.
South America and Africa are in the south,
Australia and Antarctica are down south too.

Continents here, continents there,
Pieces of land surrounded by water everywhere!
Continents! Continents! Continents!



CONTOUR

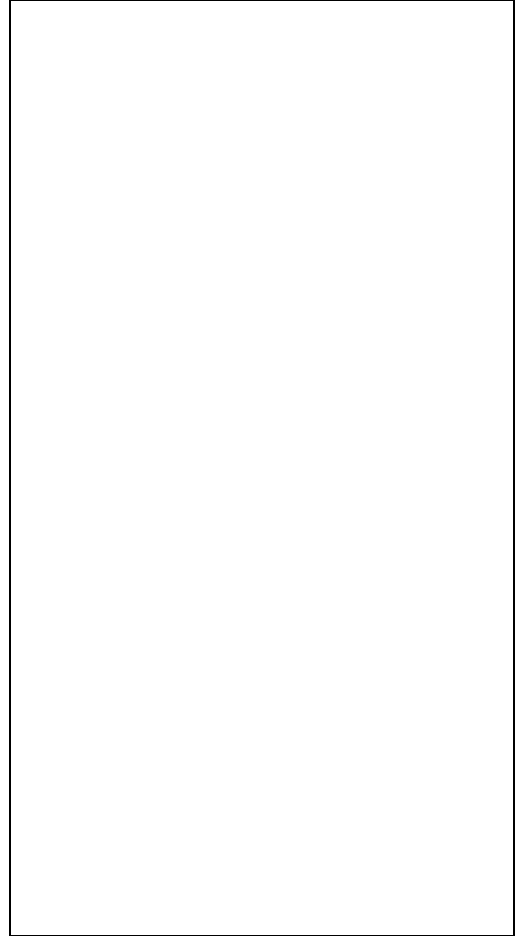
By Bre Bartels

Contour here, contour there,
contour, contour everywhere!

Gentle hills rolling,
sharp mountains jutting,
steep cliffs dropping,
and flat mesas spreading.

Contour is the deep river gorges,
contour is the long mountain ranges.
Contour is the high desert plateaus,
and contour is the wide, open plains.

Contour here, contour there,
contour, contour everywhere!
Contour means the shape of the land!



FIVE CARTOGRAPHERS

By B. Mast

Five cartographers, all drawing maps.

One drew a *physical*—so exhausted from the elevations,
he took a nap!

Four cartographers, all drawing maps.

One drew a *thematic*—so exhausted from the symbols,
she took a nap!

Three cartographers, all drawing maps.

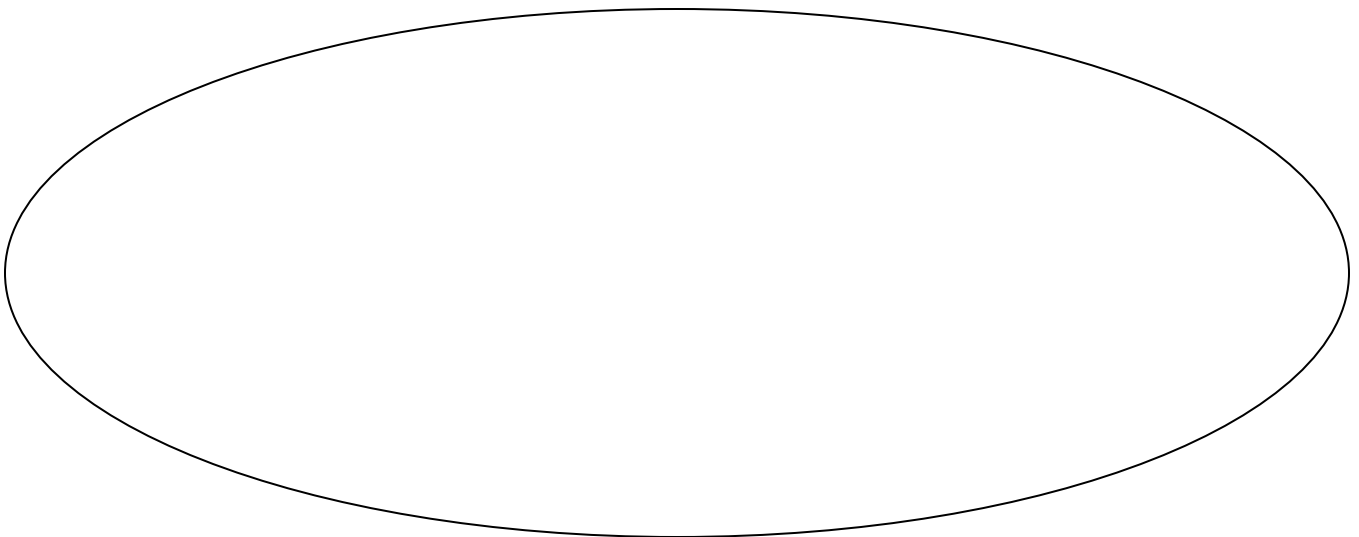
One drew a *political*—so exhausted from the boundaries,
he took a nap!

Two cartographers, both drawing maps.

One drew a *mobility*—so exhausted from the highways,
she took a nap!

One cartographer, drawing a map.

Woke up the others and said, "You draw, while **I** take a nap!"



Geologist Bugaloo

By Laura Curry

I'm a geologist and I'm here to say,
"I study landforms every day.
Sometimes I write a paper, sometimes I read a book,
But most days I just go on out and take a look."

Mountains, valleys, plateaus too,
Doing the geologist bugaloo!

Traveling through Oregon it's plain to see
That everything is shaped by geology.
The climate, the scenery and the jobs people do,
All those ancient changes in the earth affect me and you.

Mountains, valleys, plateaus too,
Doing the geologist bugaloo!

The volcanic Cascade Range is so high
Its rainshadow keeps Eastern Oregon dry.
The Columbia Plateau was formed when lava flowed through,
And now this elevated region produces grain and cattle too.

Mountains, valleys, plateaus too,
Doing the geologist bugaloo!

The Columbia Gorge was carved out by a flood
That carried ice and boulders and tons of mud.
It forced its way through the mountains, then flowed on down,
To give Willamette Valley farmlands their fertile ground.

Mountains, valleys, plateaus too,
Doing the geologist bugaloo!

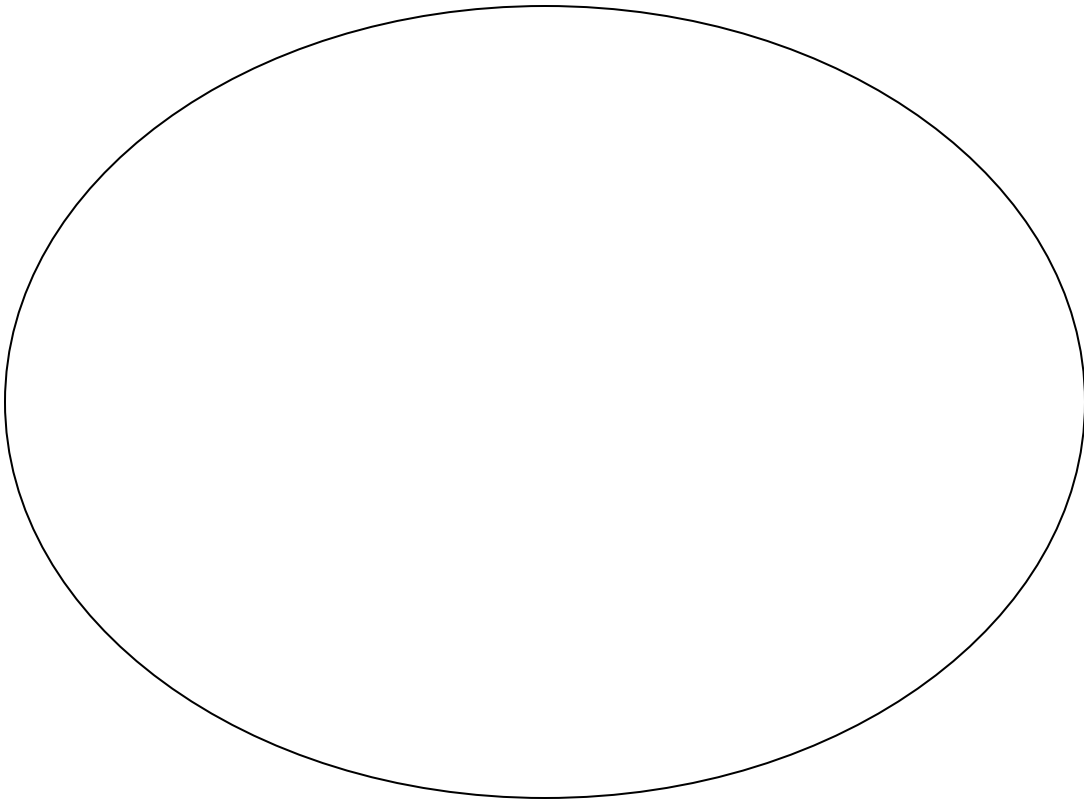
I Can Spell

By Tracy Beaird

I can spell map, m-a-p.
I can spell key, k-ey.
I can spell sea, s-e-a.
But I can't spell environment.

I can spell globe, g-l-o-b-e.
I can spell road, r-o-a-d.
I can spell pole, p-o-l-e.
But I can't spell environment.

Yes I can! Yes I can!
E-n-v-i, r-o-n, m-e-n-t, environment!



YOU ARE MY LANDFORMS

by Bre Bartels

You are my landforms, my varied landforms,
you shape the earth in so many ways.
You'll never notice how fun you make life,
please don't take my landforms away.

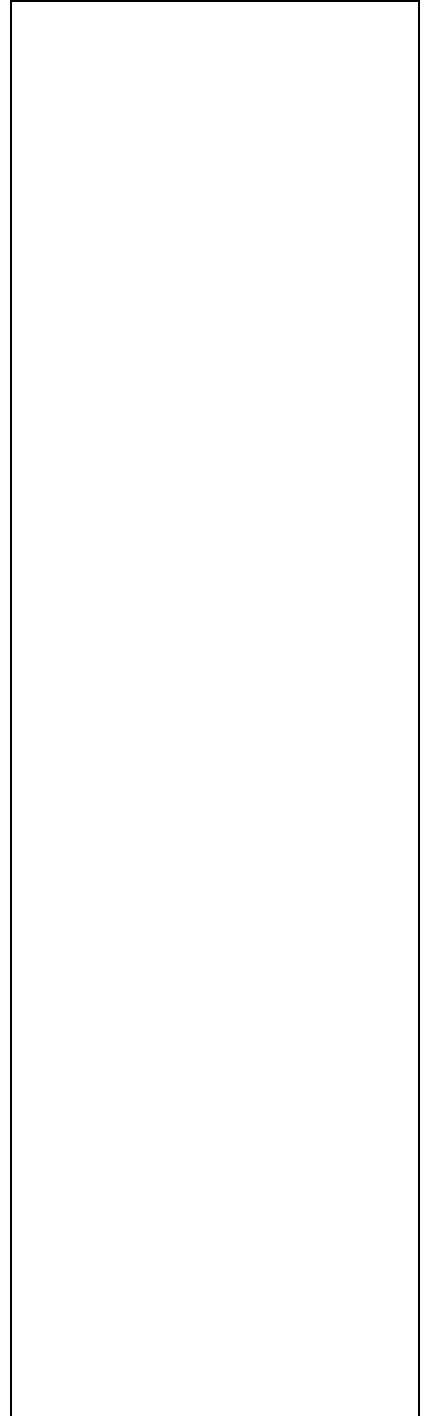
I climbed a mountain, a tall steep mountain.
I reached my hands up into the sky.
Formed in years past, from plate action.
Thank you for letting me climb so high.

You are my landforms, my varied landforms,
you shape the earth in, so many ways.
You'll never notice how fun you make life,
please don't take my landforms away.

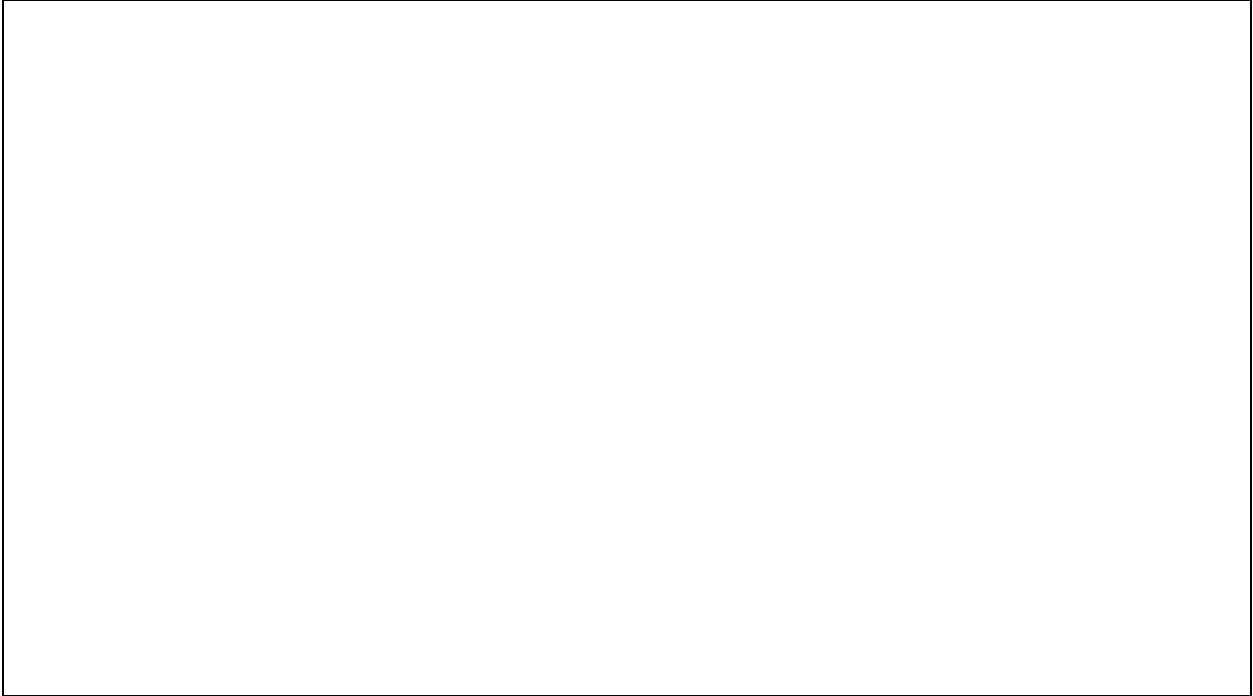
I walked the flat plains, that went forever.
I could see for miles and miles.
The soil is rich here, and best for farming,
Your fruits and vegetables make kids all smile.

You are my landforms, my varied landforms,
you shape the earth in so many ways.
You'll never notice how fun you make life,
please don't take my landforms away.

I crossed a river, a raging river,
the water swiftly ran downstream.
You drain the mountains, of their rainwater.
You give us swimming holes and fresh fish that gleam.



You are my landforms, my varied landforms,
you shape the earth in so many ways.
You'll never notice how fun you make life,
please don't take my landforms away.



LINES

(To the tune of "Signs")

by Bre Bartels

And the lines say, "You can use us to find places on a globe."
So I looked at the latitude and longitude lines, to find my way back home.
I put the horizontal with the vertical, to help know which way to go.
Together these lines form a grid, a route home that I'll know.

Lines, lines,
everywhere are lines.
Dividing up the globe,
showing places that I'll find.
Meridian, parallel,
can you follow the lines?

And latitude lines run east to west, also called parallels.
They tell you your location north or south of the equator we know so well.
And longitude lines run north to south, also called meridians.
They tell you your location, east or west of the prime meridian.

Lines, lines,
everywhere are lines.
Dividing up the globe,
showing places that I'll find.
Meridian, parallel,
can you follow the lines?

And the lines say, "Put us together, to find where you are."
Every place on the earth has a special spot, no matter if it's near or far.
These places on the globe are all unique, just like a street address.
You can locate anything in this way, from a city to a wilderness.

Lines, lines,
everywhere are lines.
Dividing up the globe,
showing places that I'll find.
Meridian, parallel,
can you follow the lines?

MAP PROJECTION BUGALOO

by Bre Bartels

Well, we are map projections and we're here to say,
"We can show you the world in many different ways.
We represent a sphere on something flat,
But we're not all the same, now that's a fact!"

Mercator, Conical, Robinson too,
doing the map projection bugaloo!

A Mercator is great for sailing ships,
'cause it shows you true directions so sailors won't have fits.
But it stretches out the poles at South and North,
causing all the continents to distort.

Mercator, Conical, Robinson too,
doing the map projection bugaloo!

A conical projection looks just like it sounds,
put a cone on the globe to cover a lot of ground.
It keeps shapes true and shows grids well,
but you can't fit it all in as you can tell.

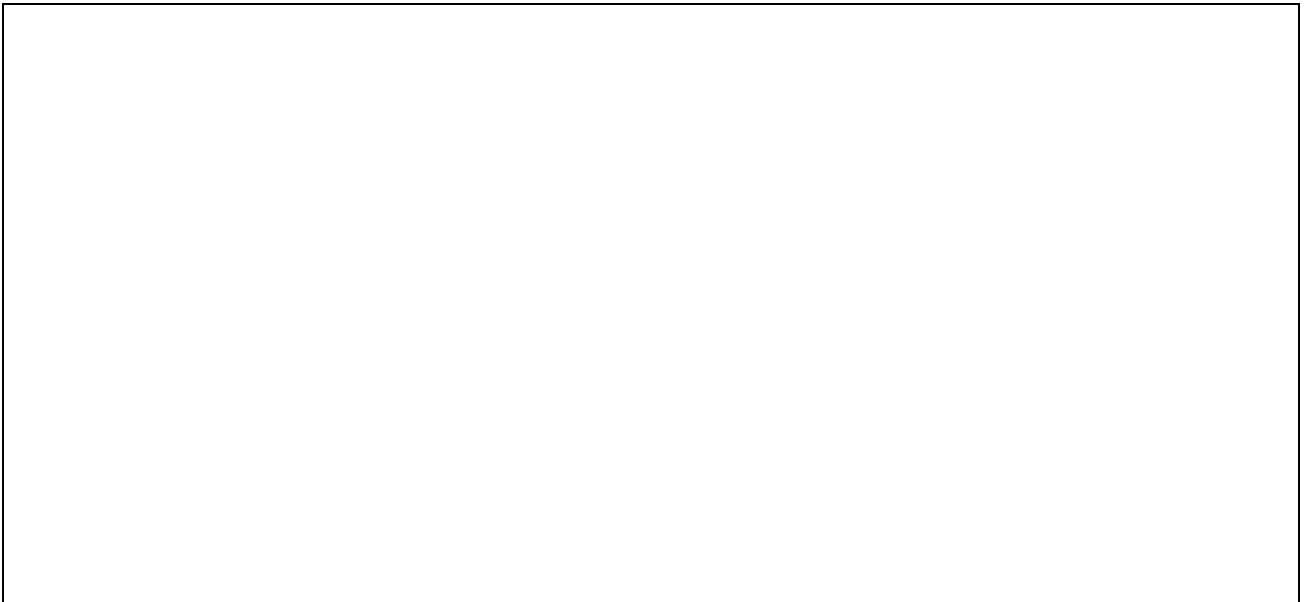
Mercator, Conical, Robinson too,
doing the map projection bugaloo!

Robinson is great all around,
it has the least distortions, we have found.
But it can't show the planet as a sphere,
only a globe can, that's very clear.

Mercator, Conical, Robinson too,
doing the map projection bugaloo!

Next time you need a map for work or play,
make sure it's the right projection before you pay.
We're made for different reasons and we're all unique,
the globe looks different when it's drawn with each special
technique.

Mercator, Conical, Robinson too,
doing the map projection bugaloo!



MAP SOUND OFF

By Bre Bartels

We all know cause we've been told,
a paper map is not a globe.
Maps show you the earth on something flat,
It sure is great to have a map.

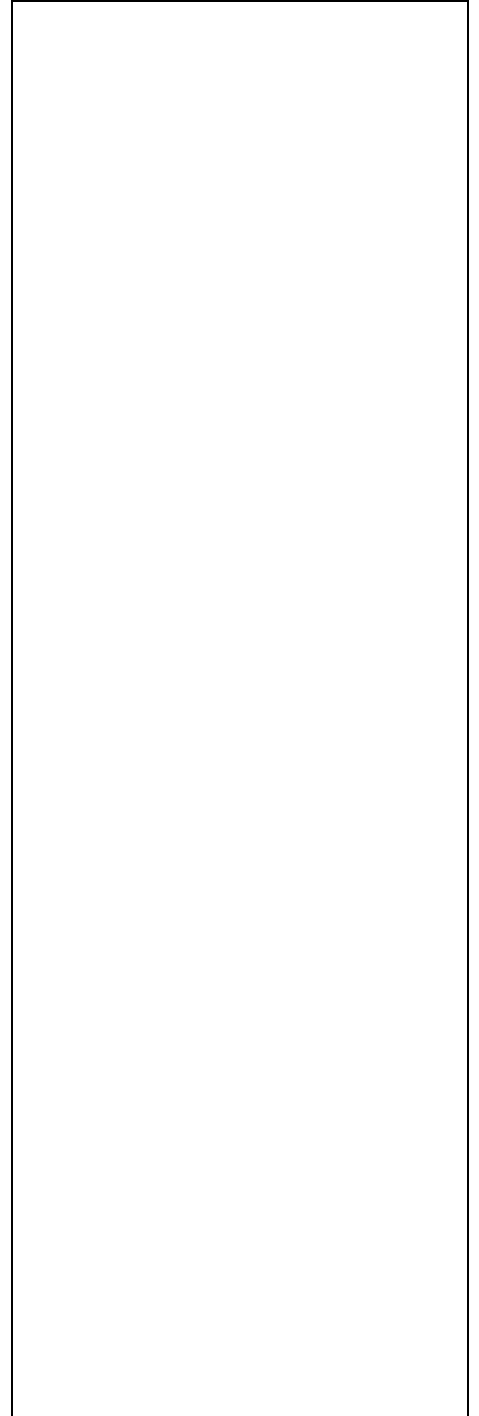
Compact--compact
Useful--useful
Compact, useful maps!

A map is a way to look at the earth,
maps aren't perfect but they still have worth.
There's no exact way to show a sphere as flat,
But maps come close despite all that.

Compact--compact
Useful--useful
Compact, useful maps!

Maps show four things about our globe:
size, shape, direction, and distance all told.
A map can't show all four equally,
so you have to choose your map carefully.

Compact--compact
Useful--useful
Compact, useful maps!



Size means how objects relate in size,
between the map and the real world before our eyes.

Shape is whether a map's forms are true,
to the actual world and its continents too.

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Useful--useful
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Direction is whether you can use your map
to find your way and stay on track.

Distance is a tool to see how far
it is to travel by plane or car.

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Useful--useful
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Every map is a compromise,
because they're not perfect you have to be wise.
But a map is more convenient than a globe,
it's compact, useful, and a thing you can fold.

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Useful--useful
Compact, useful maps!

