


Impressionistic Geography


A Three Part Series

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Montessori Foundation

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February 10, 2016

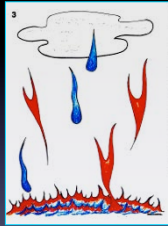


Overview Geography: Static and Dynamic
The History and Philosophy of the Charts




- Striking the Imagination: Technical and Psychological Lessons
- Impressionism
- The Role of the Impressionistic Charts

- The Impressionistic Geography Charts, begin *Dynamic Geography*. This looks at movements of the earth and phenomena that occur on the earth.
- These Impressionistic Charts capture the children's imagination, and give the children an impression of a particular reality.
- The charts are organized from a general to a detailed viewpoint.



The earth is studied in relation to the universe and to the solar system; then in relation to solar energy, movements of the earth and related consequences. Next are phenomena that modify the earth's crust and therefore conditions of life on earth; the atmosphere and phenomena related to it, the hydrosphere and phenomena related to it.

- The Charts help the children to know the different phenomena in a simple way, near to their experience or level. Not all the charts are impressionistic, some are more scientific.
- We examine one difficulty at a time and then combine with others. For example, we consider the earth still, then rotation, then revolution, then both movements together.

Are They Misnamed?

- The name is misleading.
- These charts are not traditional geography. Their massive curriculum is not just geography; it forms the heart of the dynamic physical sciences plan for upper elementary school.
- They differ from traditional geography in that they are meant to powerfully strike the children's imagination. These charts are not only meant to convey information, they are meant to excite, inspire, and motivate students through their imaginations.



The Content or Curriculum

- Geography, and:
- Anthropology
- Astronomy
- Botany
- Chemistry
- Fundamental Needs of People
- Historical Geology
- Geology
- History
- Meteorology
- Oceanography
- Physics

The Organization of the Charts

- Chapter 1: The Universe, Solar System and the Earth (7 Charts)
- Chapter 2: Solar Energy and the Earth (10 Charts)
- Chapter 3: Movements of the Earth and Their Consequences (12 Charts)
- Chapter 4: The Atmosphere and its Phenomena (8 Charts)
- Chapter 5: The Work of the Wind (3 Charts)
- Chapter 6: The Hydrosphere and its Phenomena (20 Charts)

Additional Basics

- The Topics.
- Isolation.
- The Experiments.
- The Research and Project Suggestions.
- How to Present the Charts.
- When to Present the charts.

Levels to Present the Charts

Age Range

Charts 1-6	Presented as a part of history	Lower Elementary
Chapters 1 & 2		Fourth Year
Chapters 3 & 4		Fifth Year
Chapters 5 & 6		Sixth Year

Fourth Year

- Chapter One
- Chapter Two
- Note: Chapter One is also used in History for Lower Elementary

Chapter One

The Universe, Solar System and the Earth

- Seven Charts 1-7
- 33 Topics
- 19 Experiments
- 32 research and Project Suggestions

Chapter 1: Topical Overview

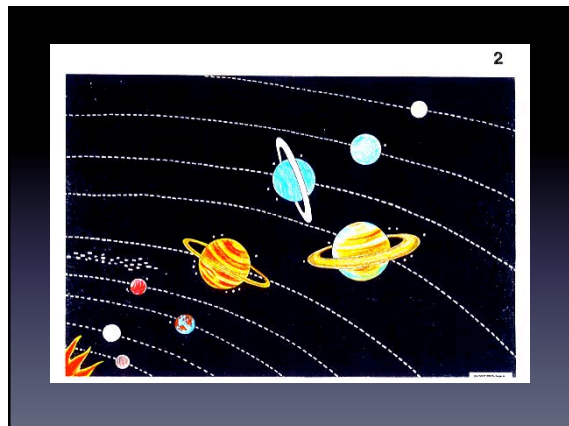
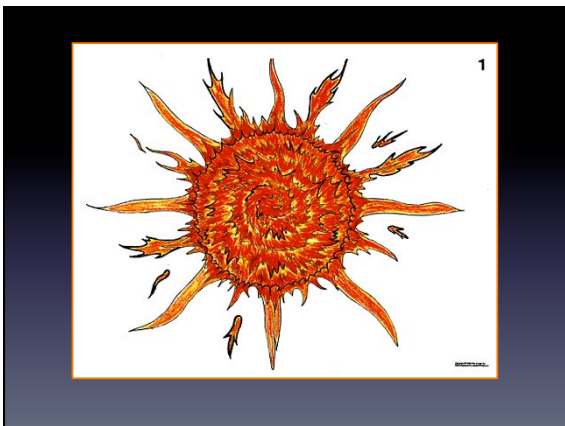
- The Formation of the Earth
- Force of Attraction
- Force of Repulsion
- Centripetal and Centrifugal Force
- Inertia
- Friction
- Gravity
- Chemical Reaction
- Precipitation
- Matter and Energy
- Mixtures
- Crystallization
- States of Matter
- Materials change state at different temperatures
- The Sun and the Earth
- The Solar System
- The Beginning of the Cooling Process of the Earth

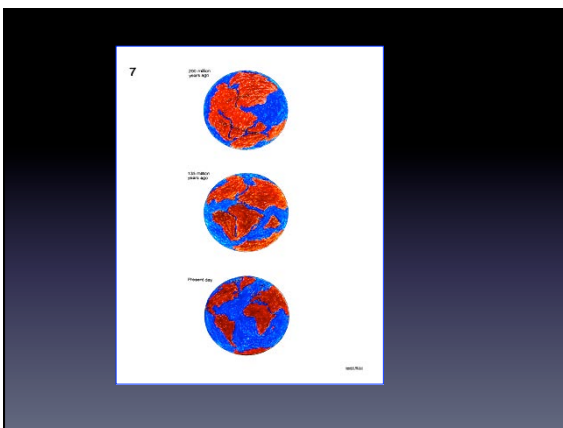
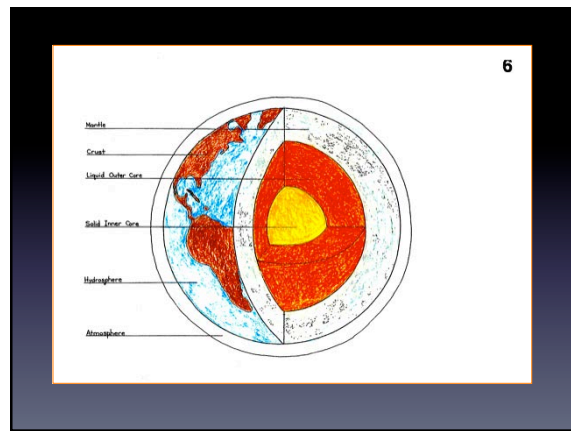
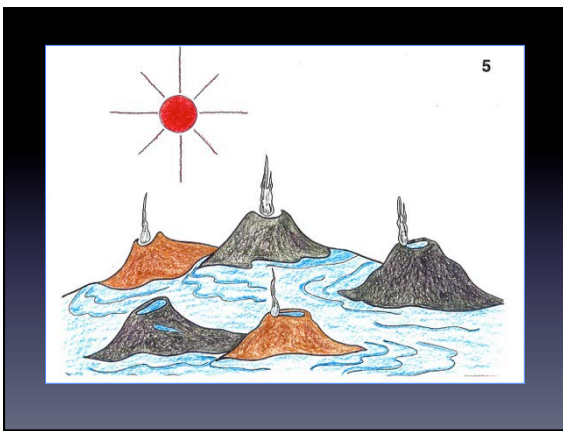
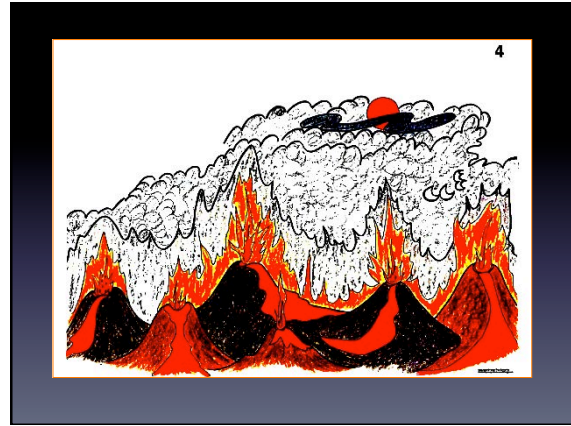
More Chapter 1 Topics

- Hot Air Rises
- Volcanism
- Filling the Oceans
- Erosion
- Layers of the Earth
- Liquid and Viscous
- Elastic, Plastic, Rigid
- Specific weight
- Density.
- Lithosphere
- Stratification of Rocks
- The Rock Cycle
- Igneous rock
- Sedimentary rock
- Metamorphic rock
- Continental drift

Chapter 1 The Universe, Solar System and the Earth

Sensorial Title	Technical Title
1. How Small the Earth Is !	A Comparison of the Size of the Earth to the Sun
2. The Sun's Family	The Solar System
3. The Cosmic Dance	The Beginning of the Cooling Process
4. The Time of the Volcanoes	Volcanism and the Cooling Process
5. The Sun's Beautiful	Cooling and Filling the Daughter Oceans
6. What's Inside the Earth?	Geochemical Constitution of the Earth
7. The Continents Drift!	The Evolution of the Continents





Chapter 1: Experiments

Experiment 1: Force of Attraction	Experiment 7: Erosion
Experiment 2: Centrifugal and Centripetal Force	Experiment 8A, 8B: Air Occupies Space
Experiment 3A, 3B, 3C, and 3D: Force of Inertia	Experiment 9A, 9B: Specific Weight
Experiment 4A, 4B: Force of Gravity	Experiment 10: Stratification of Rocks
Experiment 5: Hot Air Rises	Experiment 11: Formation of the Mountain
Experiment 6: Volcanism	Experiment 12: Fracture of the Earth's Crust
	Experiment 13: Stratification of Rocks Observation of the Three Groups of Rocks

Chapter 1: Research and Project Suggestions

- Classify the stars according to light color and size.
- Graph the representative distances of the principle star from Earth.
- Gather information on the principle constellations.
- Make a visit to a planetarium if possible, slides, films on the universe are suggested.
- Gather information and pictures on the other planets (may divide the class into groups).
- Build the planets with clay or papier-mâché, with size proportional, arrange them using proportional positions, on a wall, floor, ceiling.
- Make a graph to show the distance of the planets from the sun
- Graph the planets in relation to the sun in proportional dimension
- Gather information and pictures regarding space exploration.
- Prepare charts and illustrations of the consistencies and proportions of the continental land masses through the ages, i.e. continental drift.

Chapter 1: More Research and Project Suggestions

- Collect pictures and illustrations of volcanoes, especially presently active ones. Research principle volcanic eruptions in history.
- Look for practical examples showing how hot air rises.
- Find examples of gravity in daily life.
- Earthquakes-visit a seismic center.
- Locate the seismic zones of the world by means of maps.
- Graph the principle earthquakes.
- Collect photos of changes caused by earthquakes.
- Make a chart of specific weights of most common elements.
- Observation of the stratification of rocks in the environment, includes a drawing exercise.
- A collection of minerals and/or fossils and their classification.
- A visit to a museum of natural history.

Chapter Two

Solar Energy and the Earth

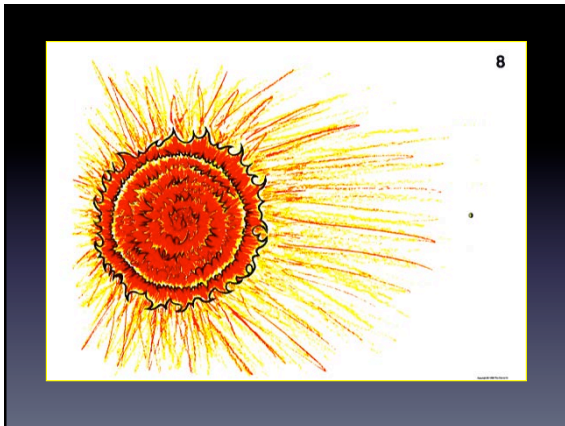
- Ten Charts 8-17
- 10 Topics
- 6 Experiments
- 10 research and Project Suggestions

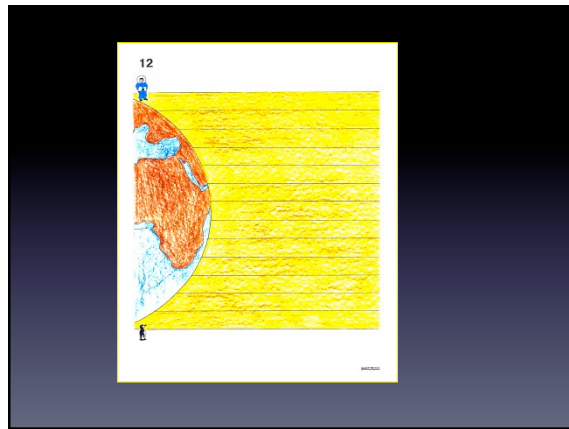
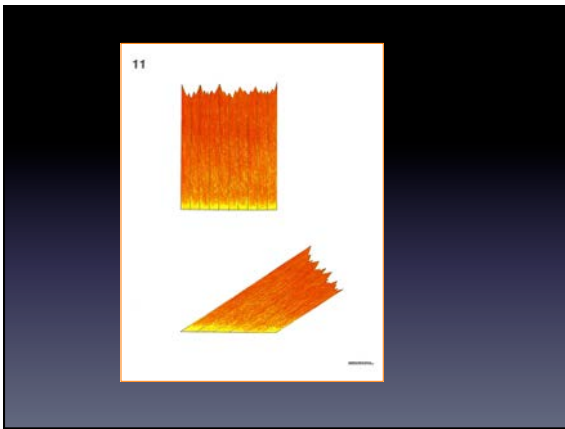
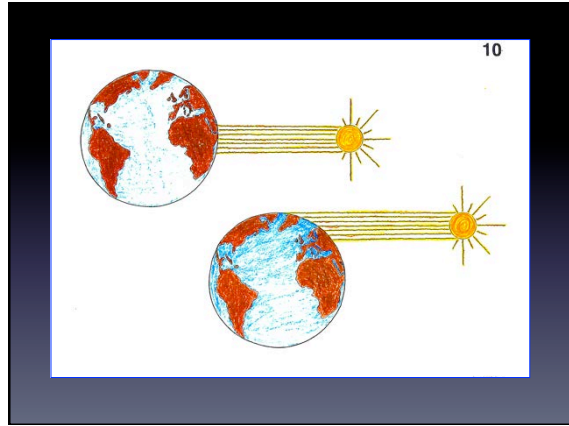
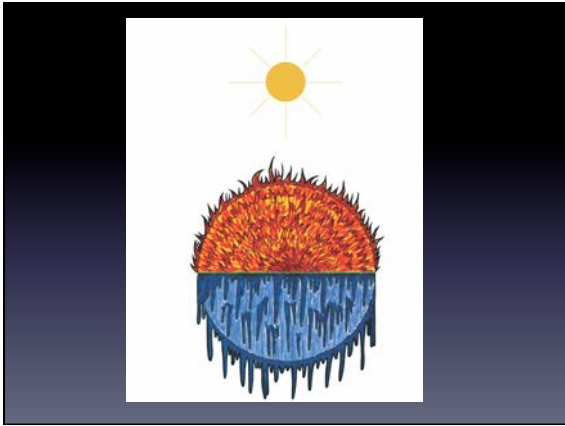
Chapter 2 Topical Overview

- Insolation or Solar Energy absorbed by the Earth
- Rotation of the Earth
- Revolution of the Earth
- Illumination of the Earth
- Perpendicular and Oblique Rays
- The Illumination of the Equator compared to the Poles
- Different dispersions of Solar Energy in crossing the Atmosphere
- The Atmosphere as a Bad Conductor of Heat
- The Radiation of stored heat from the Earth
- Good and Bad Conductors of Heat

Chapter 2: Solar Energy and The Earth

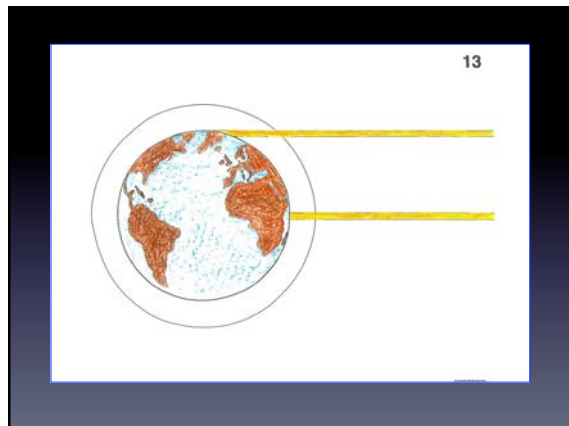
Sensorial Title	Technical Title
8. Solar Energy Absorbed by the Earth	Insolation
9. Fire and Ice	If the Earth Did Not Rotate
10. How the Rays of the Sun Reach the Earth	Perpendicular and Oblique Solar Rays
8. What Are The Rays of the Sun Like When They Reach The Earth?	A Different Number of Rays Cover Like Areas
9. The Rays Work to Reach The Earth	The Work of the Rays of the Sun in Passing Through the Atmosphere

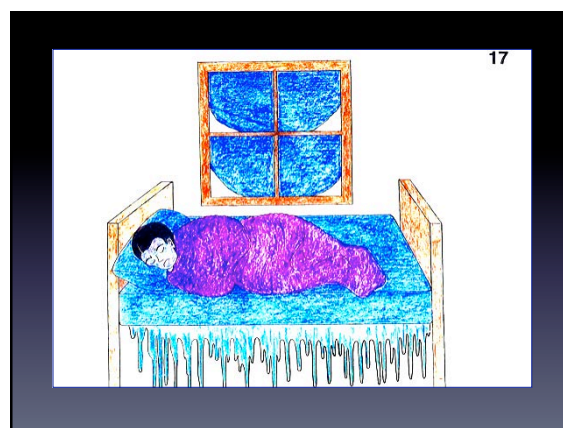
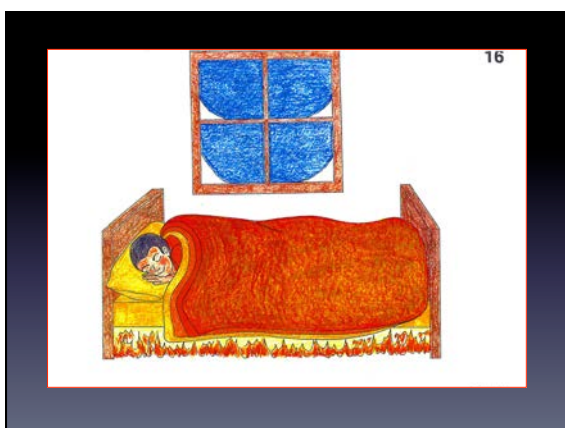
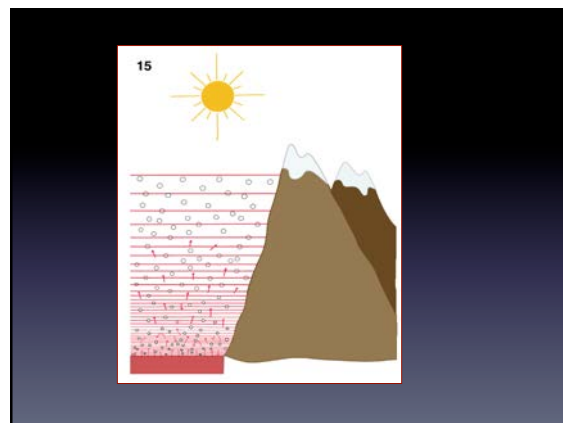
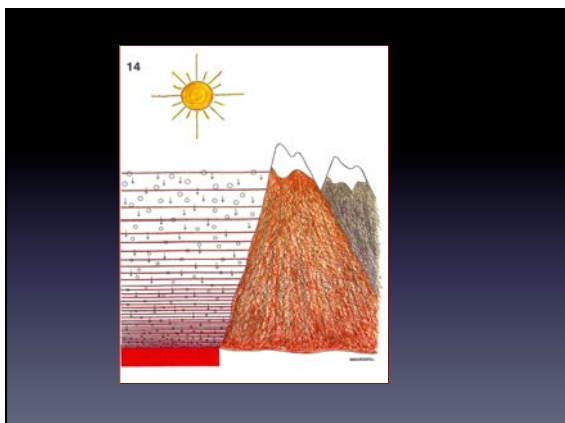




Chapter 2 Solar Energy and the Earth, Continued

Sensorial Title	Technical Title
13. The Rays Work to Reach the Earth	The Work of the Rays of the Sun in Passing Through the Atmosphere
14. The Earth Stores Heat	The Atmosphere as a Poor Conductor of Heat
15. The Earth Gives Back Heat	Radiation
16. Like a Warm Bed	Radiation: Retaining Heat
17. Like a Freezing Bed	Radiation: Dispersing Heat





Chapter 2 Experiments

- Experiment 14: Solar Energy
- Experiment 15: Illumination of the Earth
- Experiment 16: The Perpendicular and the Oblique Rays
- Experiment 17: Illumination of the Equator and the Poles
- Experiment 18A and 18B: Good and Poor Conductors of Heat

Chapter 2 Research and Project Suggestions

- Research various parts of the earth and heat distribution in various seasons.
- Make a graph representing temperatures at different heights.
- Graph showing differences of temperature at sea level and on a mountain.
- Graph temperature throughout the day.
- Graph temperature throughout the year.
- Graph temperature in your home and another distant city or locale. Keep records.
- Distribution of heat in various parts of the Earth.
- Investigate the insolation of the planets.
- Investigate various energy sources. How are each related to the sun?
- Find out about alternative energy.

Fifth Year

- Chapter Three
- Chapter Four

Chapter 3: Movements of the Earth and their Consequences

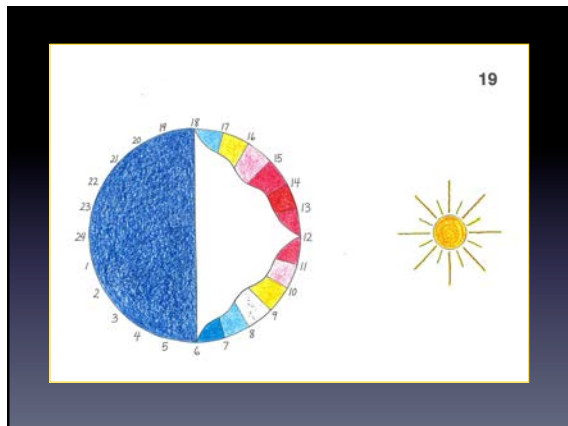
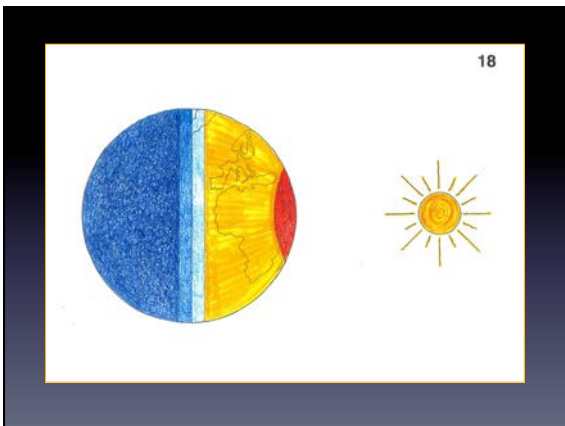
- Twelve Charts 18-29
- 15 Topics
- 4 Experiments
- 11 research and Project Suggestions

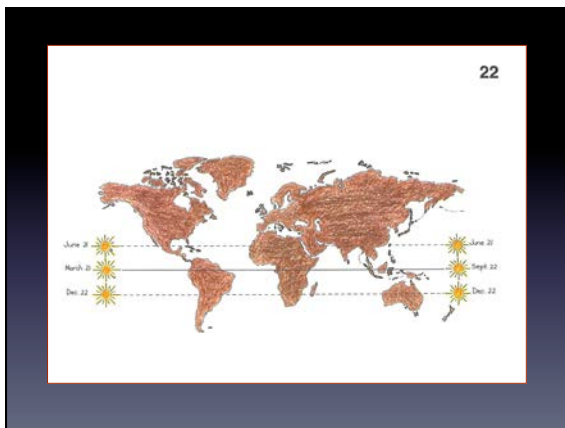
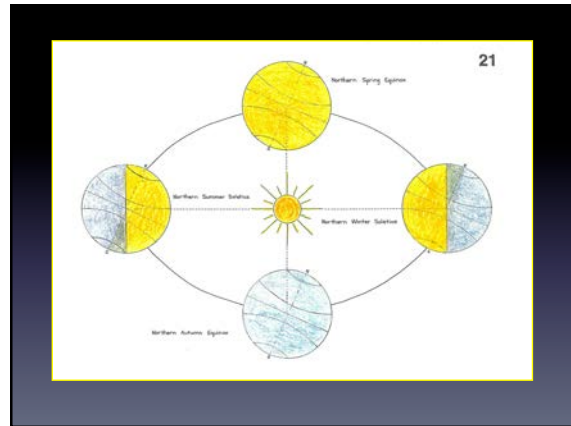
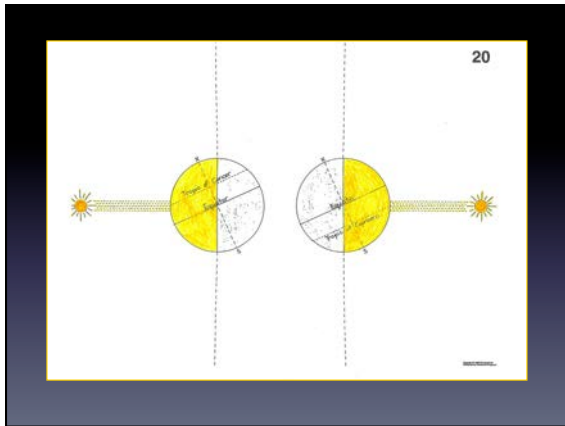
Chapter 3 Topical Overview

- Locate the fundamental points (N-S-E-W) in relation to the sun.
- Show use of the compass.
- Orienteering and compass courses
- Orienteering without compass and/or at night.
- Construction of a sundial.
- Graph the length of day and night during the year, need calendar with sunrise and sunset noted.
- Graph the length of day and night during the year, need calendar with sunrise and sunset noted.
- Graph temperatures of various houses throughout the day.
- Locate the principle cities of the world and note the time difference between these cities and your home.
- You can compare the times in different countries.
- Examine human life in different climatic zones.

Chapter 3 Movements of the Earth and Their Consequences

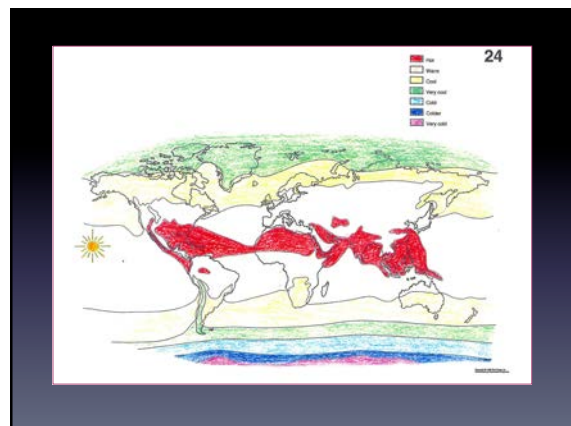
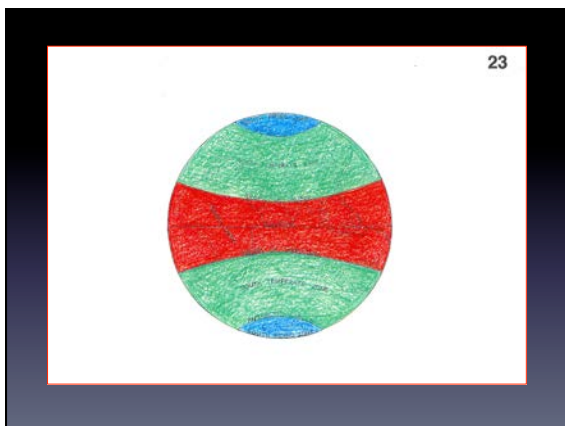
<p>Sensorial Title</p> <p>18. Day and Night</p> <p>19. What is the Hottest Time of Day?</p> <p>20 The Earth is Leaning</p> <p>21. The Seasons</p> <p>22. The Seasons on the Map</p>	<p>Technical Title</p> <p>Rotation and Its Consequences</p> <p>Variations in Temperature of the Earth's Surface with Respect to the Rotation of the Earth</p> <p>The Inclination of the Axis of the Earth</p> <p>The Revolution of the Earth and the Seasons</p> <p>The First Day of Each Season</p>
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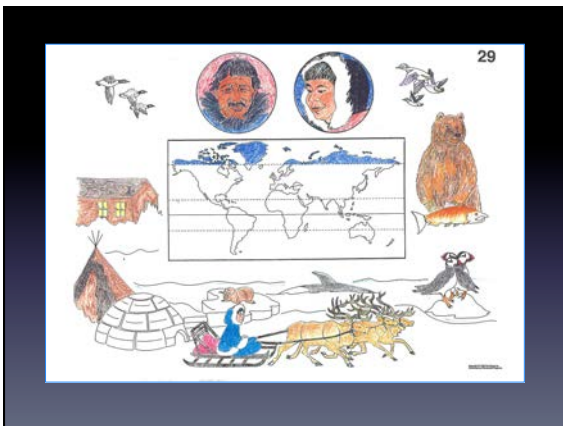
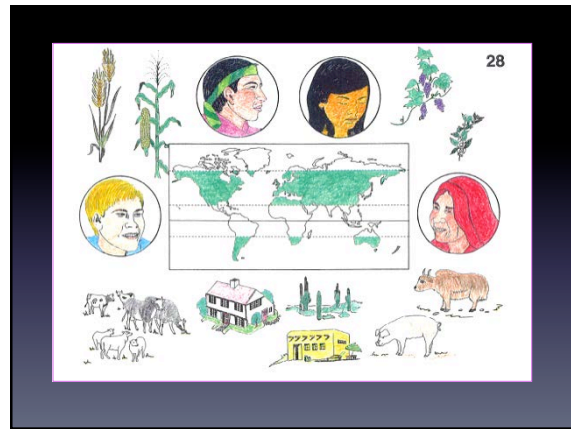
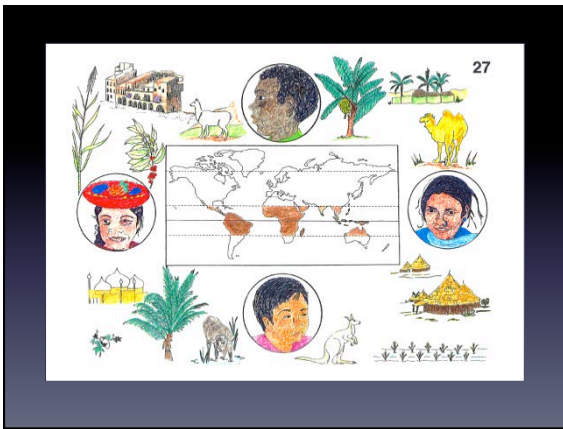
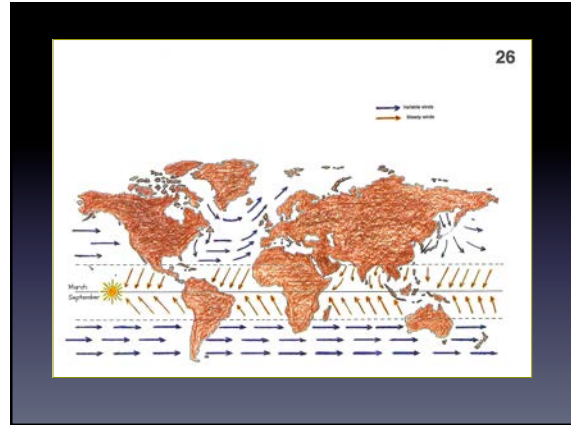
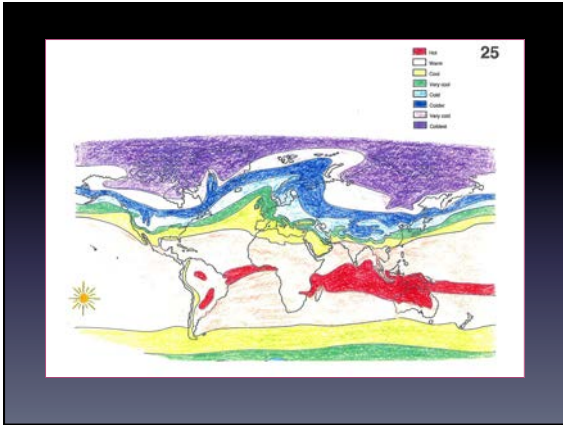




Chapter 3 Movements of the Earth and their Consequences, Continued

Sensorial Title	Technical Title
23. The Zones of the Earth	Astronomic Zones
24. Our Summer	The Northern Summer Solstice
25. Our Winter	The Northern Winter Solstice
26. Spring and Autumn	The Vernal and Autumnal Equinoxes
27. Torrid Zone	The Equatorial Climatic Zone
28. Temperate Zones	The North and South Temperate Climatic Zones
29. Frigid Zones	The Arctic and Antarctic Climatic Zones





Chapter 3 Experiments

- Experiment 19: Day and Night
- Experiment 20: Inclination of the Polar Axis
- Experiment 21: Marking off the Imaginary Parallels
- Experiment 22: The Seasons

Chapter 3 Research and Project Suggestions

- Locate the fundamental points (N-S-E-W) in relation to the sun.
- Show use of the compass.
- Orienteering and compass courses
- Orienteering without compass and/or at night.
- Construction of a sundial.
- Graph the length of day and night during the year, need calendar with sunrise and sunset noted.
- Graph temperatures of various houses throughout the day.
- Locate the principle cities of the world and note the time difference between these cities and your home.
- You can compare the times in different countries.
- Examine human life in different climatic zones.
- Examine animal life in different climatic zones

Chapter 4: The Atmosphere and its Phenomena

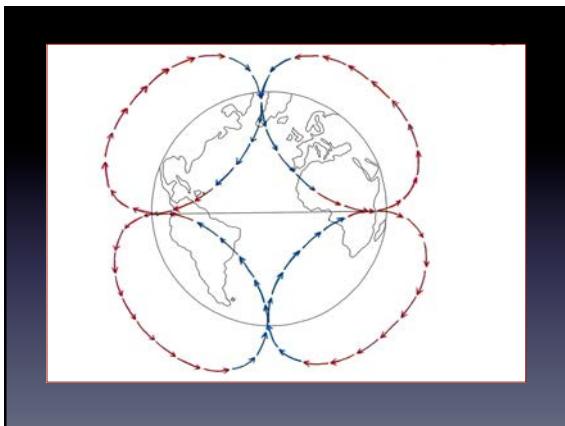
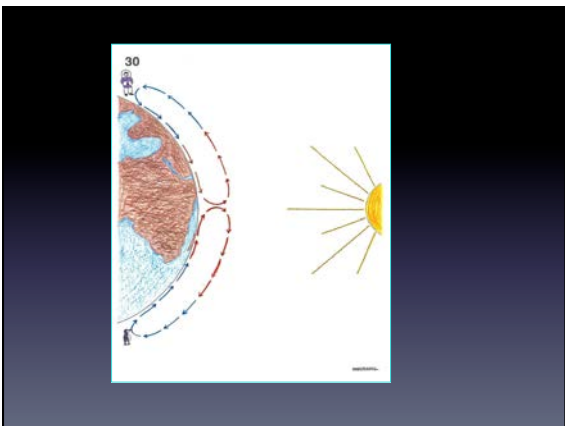
- Eight Charts 30-37
- 10 Topics
- 4 Experiments
- 13 Research and Project Suggestions

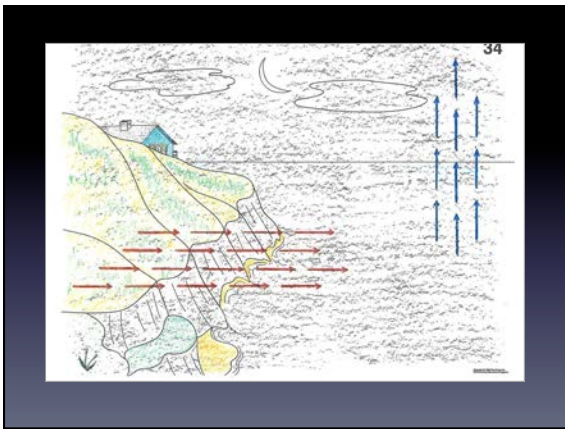
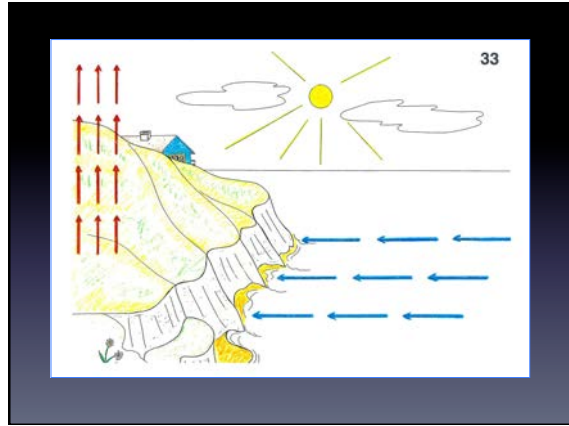
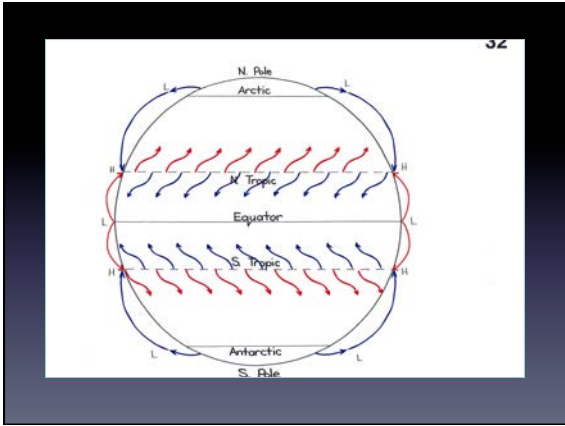
Chapter 4: Topical Overview

- Air Pressure
- The Formation of the Winds
- Low and High Pressure
- Regular Winds
- Rapidity of Cooling Depends on the Nature of the Body
- Sea Breeze
- Land Breeze
- Monsoon Winds
- Summer dry winds
- The layers of the atmosphere.

Chapter 4: The Atmosphere and its Phenomena

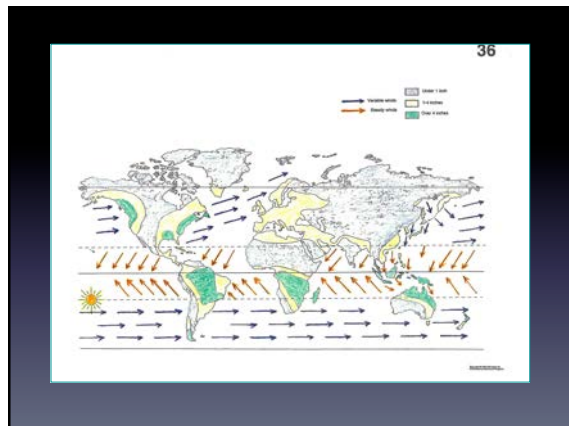
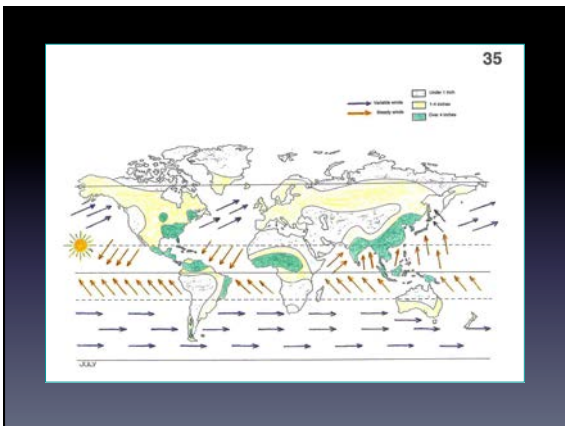
Sensorial Title	Technical Title
30. How the Winds Form	The Formation of the Winds
31. Wind Cycles	Winds: A Scheme of Their Formation
32. Regular Winds	
33. A Sea Breeze	Local Winds: the Daytime Sea Breeze
34. A Land Breeze	Local Winds: the Nighttime Land Breeze

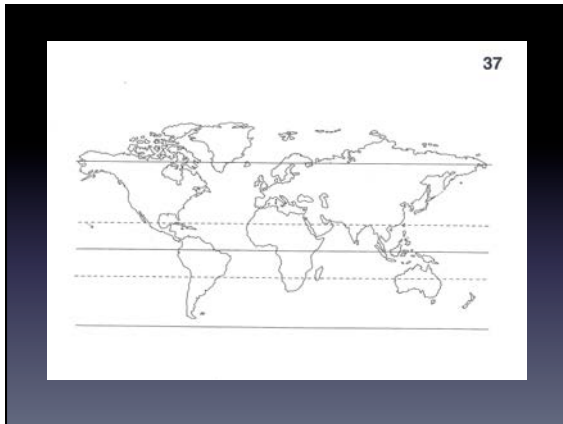




Chapter 4: The Atmosphere and its Phenomena, Continued

Sensorial Title	Technical Title
	A lesson on "Winds and Their Direction at the Equinox" is given using Chart 26
35. Summer Monsoon Winds	Winds and the Distribution of Precipitation During the Summer in the Northern Hemisphere
36. Winter Dry Winds	Winds and the Distribution of Precipitation During the Summer in the Southern Hemisphere
37. Winds and the Distribution of Precipitation - Work Chart	





Chapter 4: Experiments

- Experiments 23A, 23B, and 23C: Air Pressure
- Experiment 24A: Rapidity of Cooling Depends on the Nature of the Body

Chapter 4: Research and Project Suggestions

- Practical experiences to show the fact that air occupies space.
- Practical demonstration of the movements of the air.
- Observation of a barometer. Record the various pressures.
- The construction of a barometer.
- Construct a graph showing variation of pressure in the same place at different hours of the day.
- Construct an anemometer - an instrument to measure the velocity of the wind
- Construct an instrument to measure the direction of the wind.
- Research local winds. Why do they form? Which direction do they blow? What phenomena do they cause?
- Research the layers of the atmosphere.
- Research the component gasses in the atmosphere.
- Examine air pollution.
- Research the atmospheres on other planets.
- Experiment with growing plants in other gasses

Sixth Year

- Chapter Five
- Chapter Six

Chapter 5: The Work Of The Wind

- Three Charts 38-40
- 6 Topics
- 4 Experiments
- 9 Research and Project Suggestions

Chapter 5: Topical Overview

- Heating and Cooling of Water
- Marine Currents
- Heating and Cooling of Solids
- Heating and Cooling of Salt Water
- Origin of Marine Currents
- Wind Erosion

Chapter 5: The Work Of The Wind

Sensorial Title

Technical Title

38. Marine Currents

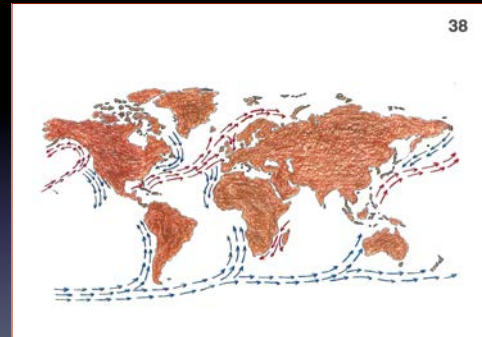
Cold and Warm Marine Currents

39. Names of Important Marine Currents

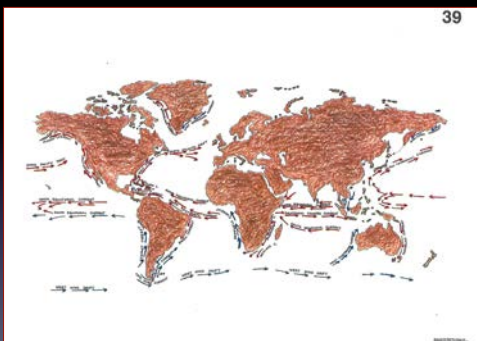
Nomenclature of Marine Currents.

40. Let's Destroy the Rock

Erosive Power of the Winds



38



39



40

Chapter 5: Experiments

- Experiment 24B: Heating and Cooling of Water
- Experiment 24A: Heating and Cooling of a Body
- Experiment 24C: Heating and Cooling of Salt Water
- Experiment 25: Origin of Marine Currents

Chapter 5: Research and Project Suggestions

- Research marine currents;
- Find illustrations or photos of places touched by warm and cold marine currents. Compare yearly temperatures for these places.
- Find pictures of wind erosion. Find other phenomena produced by wind (dunes, etc.)
- Research of other actions of wind in nature.
- Examine wind power.
- Study windmills throughout the ages.
- Examine other human uses of wind (sailing, kites, etc.)
- Research thermals.
- Study destructive winds.

Chapter 6: The Hydrosphere and its Phenomena

- Twenty Charts 41-60
- 23 Topics
- 4 Experiments
- 29 Research and Project Suggestions

Chapter 6: Topical Overview

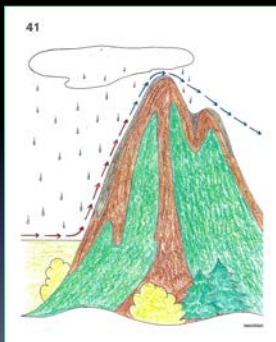
- Heating and Cooling of Water
- Marine Currents
- Heating and Cooling of Solids
- Heating and Cooling of Salt Water
- Origin of Marine Currents
- Wind Erosion

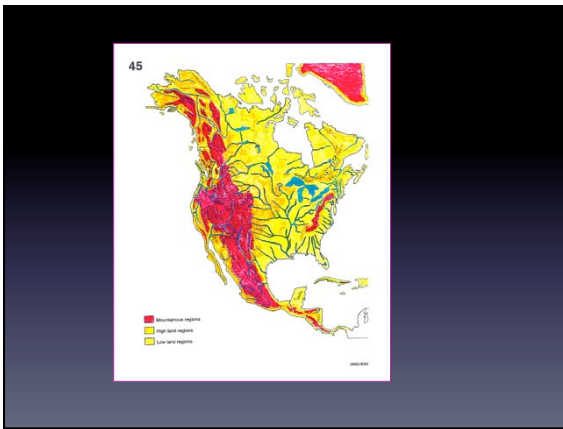
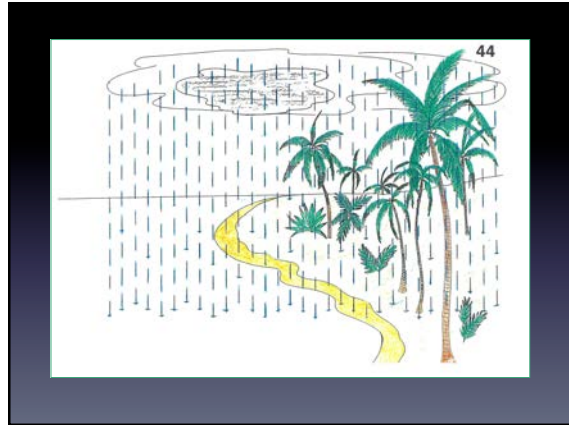
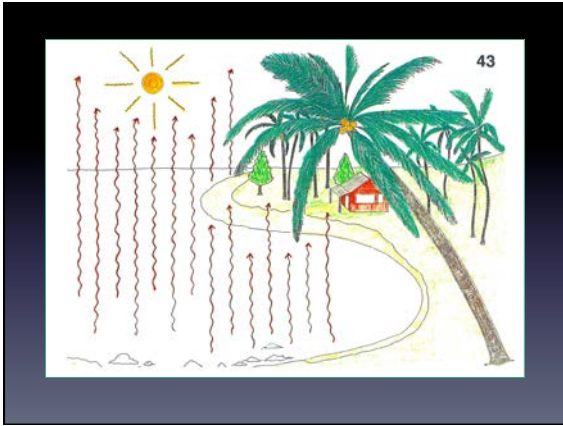
Chapter 6: Topical Overview

- | | |
|--|-----------------------------|
| • Orographic rain and desertification | • Age of Rivers |
| • Rain at the Sea: Local Rain | • Development of a Valley |
| • Evaporation and Condensation | • The Alluvial Valley |
| • Rivers | • The Canyon |
| • River Cities/Civilizations | • The Glacial Valley |
| • The Most Important Rivers of North America | • Chemical Erosion |
| • The Rivers of North America | • Expansion due to Freezing |
| • The Major Rivers of The World | • Freezing and Thawing |
| • The Erosive Work of Water | • Moraines |
| • Stratification of Sediment | • Hanging Valley |
| • Strange, erosive phenomena | • The Water Cycles |
| | • Vegetative Zones |

Chapter 6: The Hydrosphere and its Phenomena

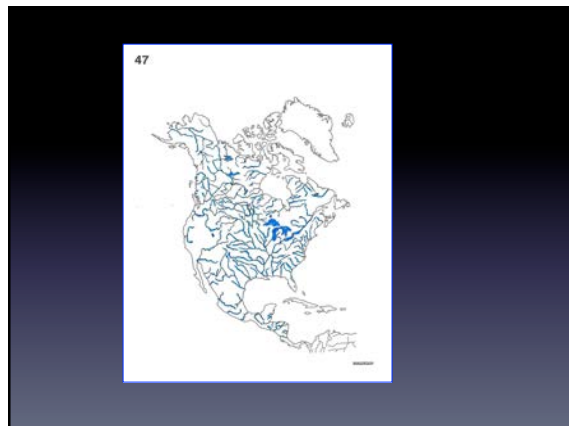
- | Sensorial Title | Technical Title |
|----------------------------|--|
| 41. Rain and the Desert | The Influence of Mountains on Precipitation and the Development of Deserts |
| 42. Rain by the Sea | Local Rain: Rain by the Sea or Local Rain |
| 43. Warm Air Rises | Evaporation |
| 44. Vapor Condenses | Condensation |
| 45. Where Do Rivers Begin? | Formation of Rivers |

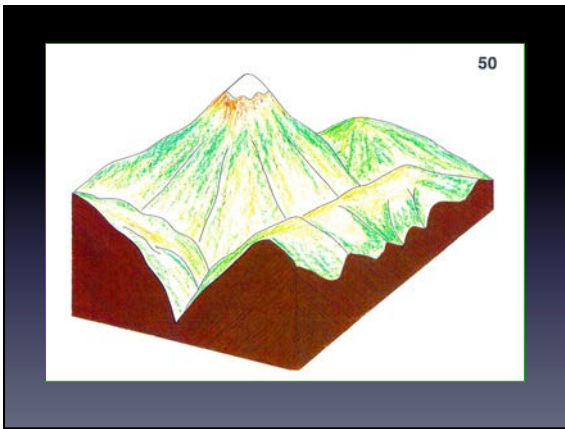
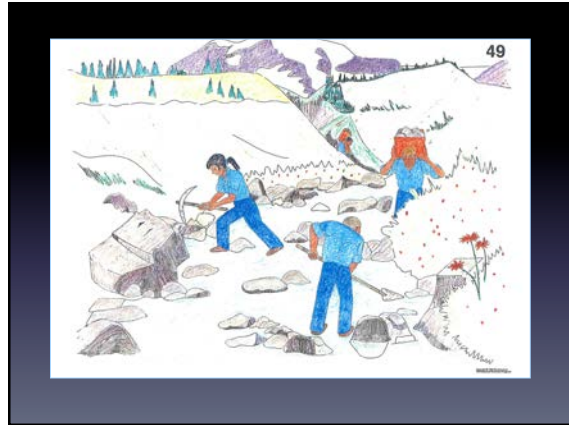
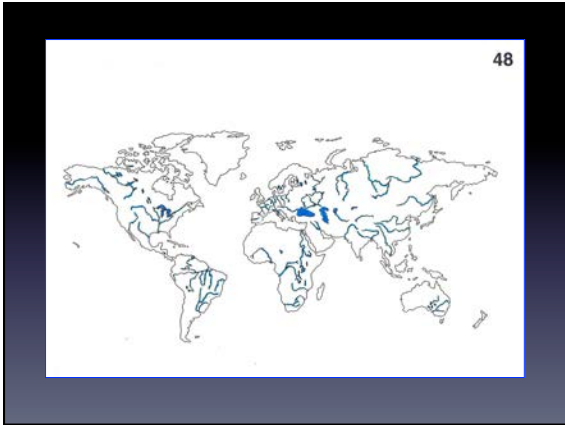




Chapter 6: The Hydrosphere and its Phenomena, Continued 1

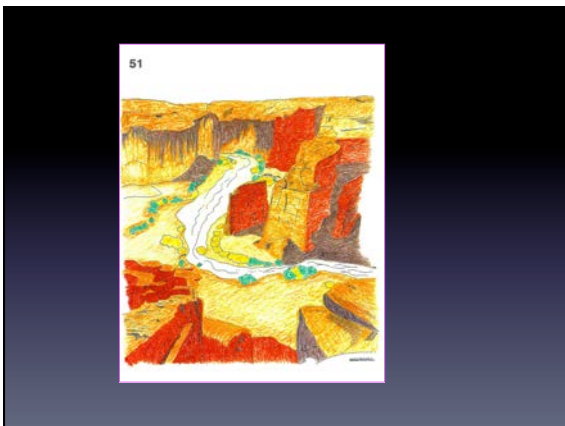
Sensorial Title	Technical Title
46. North America is Like a Sponge	Major Rivers of North America
47. North America is Like a Great Sponge	The North American Part of the Hydrosphere
48. The Earth is Like a Sponge	Major Rivers of the World
49. Let's Carry Away the Rock and Soil	The Erosive Work of Water
50. A Valley Dug by a River	The Alluvial Valley

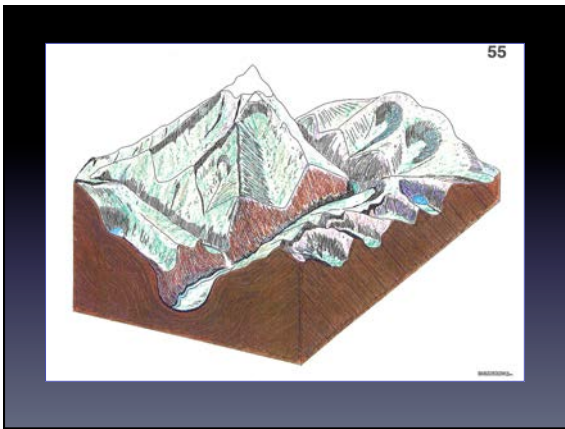




Chapter 6: The Hydrosphere and its Phenomena, Continued 2

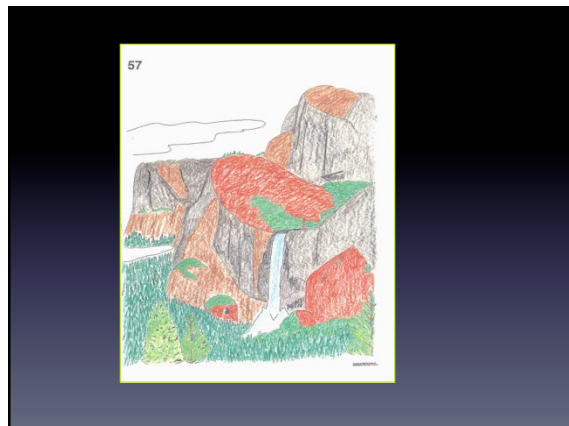
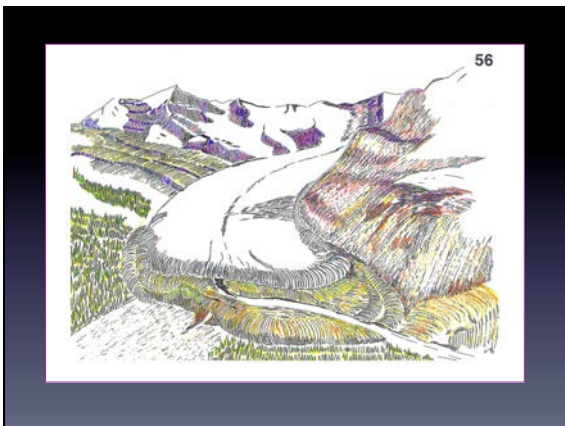
Sensorial Title	Technical Title
51. A Canyon	
52. Pillars of the Earth	Erosion: a Special Case
53. Frost -Like a Young Boy	The Winter Freeze
54. Thaw-the Young Boy Awakens	The Spring Thaw
55. A Glacial Valley	A Valley Excavated by a Glacier

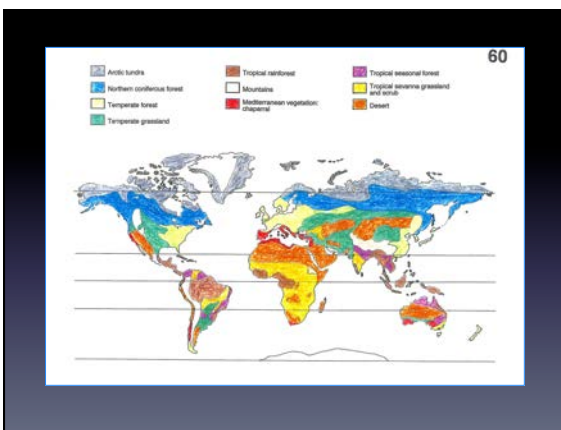
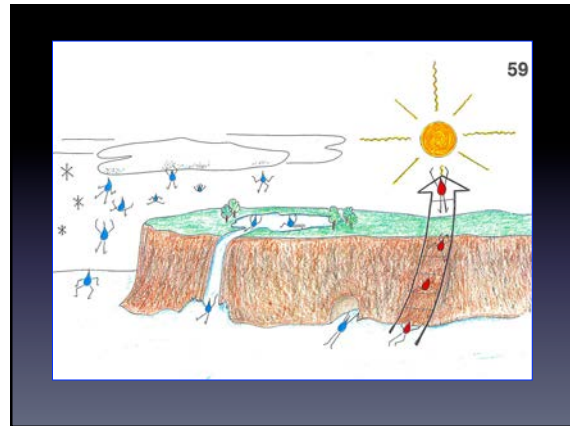
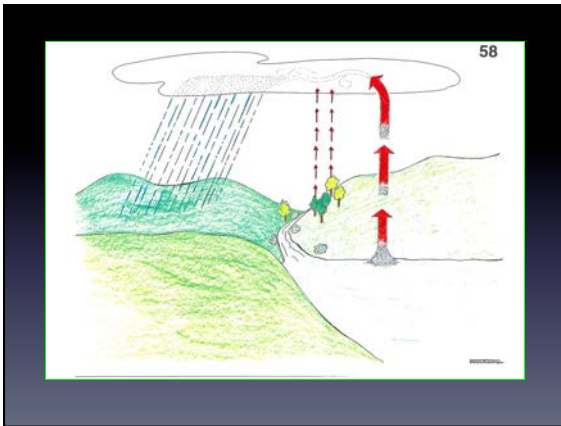




Chapter 6: The Hydrosphere and its Phenomena, Continued 3

Sensorial Title	Technical Title
56. Glaciers and the Environment	Moraines
57. When Glaciers Disappear	The Hanging Valley
58. Cycles of Water	The Water Cycle 1
59. Games of Water	The Water Cycle 2
60. Water and Plants	Types of Vegetation according to Climatic Zones





Chapter 6: Experiments

- Experiment 26: Stratification of Rocks: The Wearing away of Stratified Sediments
- Experiment 27: Development of a Valley
- Experiment 28: Destruction of the Rocks (Chemical Erosion)
- Experiment 29: Expansion

Chapter 6: Research and Project Suggestions

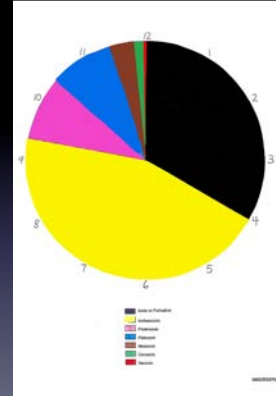
- Importance of water for life.
- River Cities and Civilizations.
- Dams and Canals.
- Rivers in transportation.
- Examine water or hydro power.
- Study hydraulics.
- Study water mills throughout the ages.
- Study irrigation.
- Examine other human uses of water.
- Rain, snow, hail, dew, fog-research these.
- Illustrate different phases in the life of a river.
- Changes caused by a river in our environment. Outings, if possible.
- Find information and illustrate mechanical and chemical actions of water.
- Glaciers-illustrate types, changes they make in environment.
- Study Ice Ages and Glaciers, show distribution in geological ages.

Chapter 6: Additional Research and Project Suggestions

- Study Oceanography
- Do a pond or stream study
- Types of vegetation and their distribution on the earth.
- Research water pollution. How can we help in diminishing pollution, which civilization and technology have brought?
- Research erosion. Study agricultural practices that reduce erosion.
- Mechanical and chemical actions of the water.
- Research mineral water.
- Research springs, including thermal springs.
- Research bogs, swamps, and marshes.
- Research ground water and subterranean waters which erode caves and tunnels,
- Learn about stalagmites and stalactites.
- Research glaciers today. Examine what is happening to them.
- Research different kinds of vegetation and their distribution throughout the earth.
- Research of other actions of water in nature.

The Clock of the Eras

- This is not really a part of the Impressionistic Charts, but is related to them.



Any Questions ?

