Unit 1:
Water Systems on Earth

Chapter 1: The water cycle
How do YOU use water???

House Hold Use

Personal Use

Recreational Activities
How we use water in our houses!!

- Showers and baths: 35%
- Toilet flushing: 30%
- Laundry: 20%
- Kitchen and drinking: 10%
- Cleaning: 5%
Water Distribution

• Only 3% of the Earth's water is fresh water!
• 2/3 of this water is frozen in ice sheets
• You do the math: Only 1% of the fresh water on the Earth's surface is available.
Important Definitions:

- **Lithosphere**: the solid rocky ground of the Earth's crust
- **Atmosphere**: the environment surrounding the Earth
- **Hydrosphere**: ALL water on Earth. Including that in the lithosphere and the atmosphere
How do we not run out of water?  
THE WATER CYCLE!!
• The water cycle is the constant cycling of water through the processes of **evaporation** and **condensation**.

• Water is constantly changing form: 

  (gas → →→ liquid)

• Driven by the **sun's energy!!**
Practice!

• Page 13 #’s 1-4, 6, 8
• Water cycle worksheet
Ocean Water vs. Fresh Water

- There are three major differences between ocean water and fresh water, which are:

  1) **Salinity:** the amount of salt dissolved in a specific amount of water
     ***salt comes from dissolved solids in the ground and volcanoes!***

  2) **Density:** the amount of mass of a substance in a certain unit volume
     (how tightly packed together the material is in a substance)

  3) **Freezing**

<table>
<thead>
<tr>
<th></th>
<th>Fresh Water</th>
<th>Salt Water</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Salinity</strong></td>
<td>Less salt</td>
<td>More salt</td>
</tr>
<tr>
<td><strong>Density</strong></td>
<td>Less dense</td>
<td>More dense</td>
</tr>
<tr>
<td><strong>Freezing point</strong></td>
<td>Higher (0°C)</td>
<td>Lower (-1.9°C)</td>
</tr>
</tbody>
</table>
PRACTICE

• Water distribution Assignment
• Core Salinity lab 1-3A & 1-3B
Sources of Fresh Water:

1. Ground water:
   - Precipitation that falls on land and sinks out of sight,
   - it sinks through pores in rocks until it reaches bedrock where it pools.
   - Drilling these pools makes wells!
2. **Glaciers:**

- *a moving mass of compressed snow and ice.*
- Found in areas where it is so cold the snow remains all year.
- Glaciers are reservoirs - they store fresh water.
- They release the water during the hot summer months
- They give us information about the Earth’s past climates.
Glaciers in mountains and on the continent of Antarctica
The Ice Age:

• The Earth has had at least 7!
• Most recent: 120 000 years ago - 11 000 years ago.

Video Clip :)
• The last glacier covered from the **Arctic** to as far south as the **great lakes**!
• The environment was **colder** and a lot of plants and animals went **extinct**.

**Figure 1.14** During the last ice age, glaciers in North America covered an area three times as large as they do today. Northern sections of the Yukon and Alaska remained free of glaciers because they were too dry.
Glaciers and Global Warming

- In the last 100 years the average surface temp has increased by 0.5ºC.
- The world’s glaciers are melting at a quicker pace than ever before.

Receding Athabasca Glacier in Alberta. It has receded 1.5 km since 1843.
What does all this mean???

• Ocean waters may rise
  • Flooding
  • Video clip
3. Drainage Basins (a.k.a watershed):

• an area of land from which water drains into a body of water (ex. river, pond, lake or ocean)
• There are many small drainage basins within a larger basin
Practice

- Page 17: #'s 1, 4, & 5
- Page 26: #'s 1-5
- Page 33: #'s 3-7
- Page 34: Checking the concepts #'s 1-2, 4-8