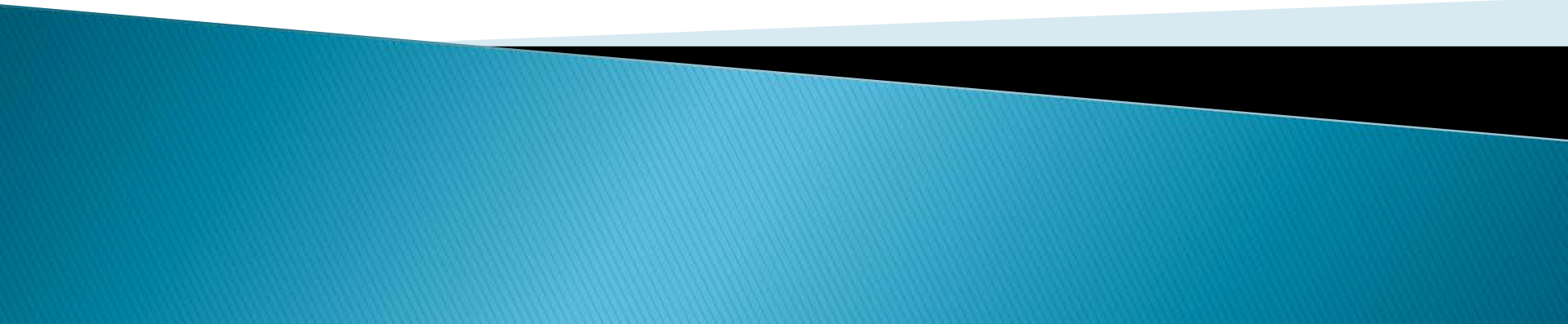


# Designing Readable Tactile Graphics



# Virginia AER

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# Topics of Discussion

- ▶ Why graphics are important
- ▶ Quick look at tactile perception
- ▶ Decision Tree: Is this a tactile graphic?
- ▶ Design principles
- ▶ Planning a graphic
- ▶ Editing the print graphic

# LITERACY

Literacy is defined as

- ▶ the ability to read and write
- ▶ the ability to derive meaning from print material
- ▶ The ability to communicate through written language

# Graphics

are part of the set  
of symbols that make  
up written language

# WHY IS IT IMPORTANT?

At least  
**50%**  
of text content  
in today's textbooks  
is presented in graphic  
form.

# High stakes tests

- State standards of learning
- College admission tests (ACT, SAT)

- Greater access to e-text and DAISY files

If braille readers are to be  
literate,

**GRAPHICS SKILLS**

must be developed.

# Exploring Tactual Perception

# Sighted Learners:

- ▶ **WHOLE TO PART**
- ▶ **perceive all parts of an object**
- ▶ **in its totality and**
- ▶ **in its relationship to other objects.**
  
- ▶ **Vision provides simultaneous perception.**

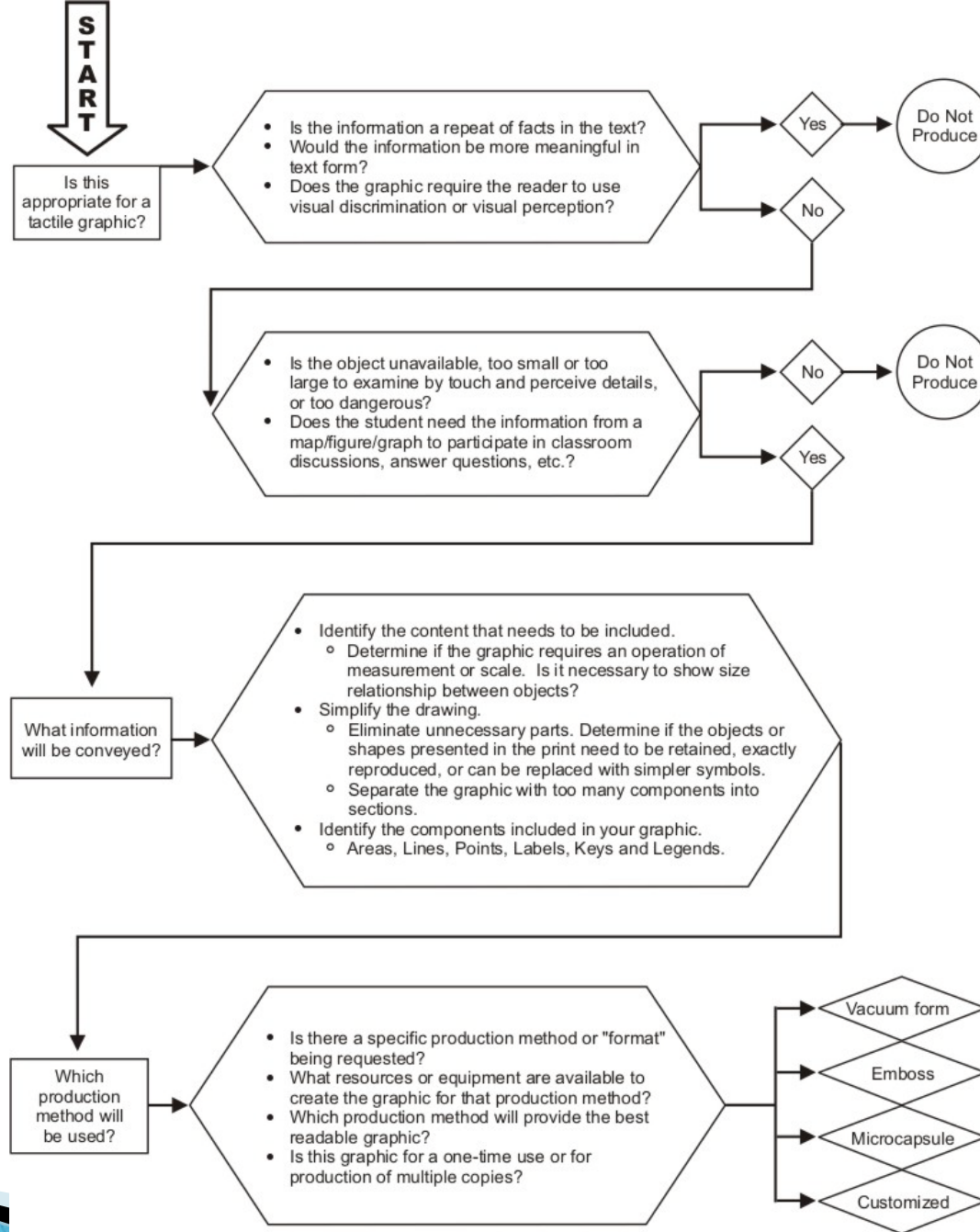
# Visually impaired learners:

- ▶ **PART TO WHOLE**
- ▶ **rely on sequential observations.**
- ▶ **only part of an object can be seen or felt at a time.**
- ▶ **the entire image has to be "built-up" out of the components.**

**Relationships with other objects can be lost entirely.**

**REPRODUCE**  
**REPRODUCE**  
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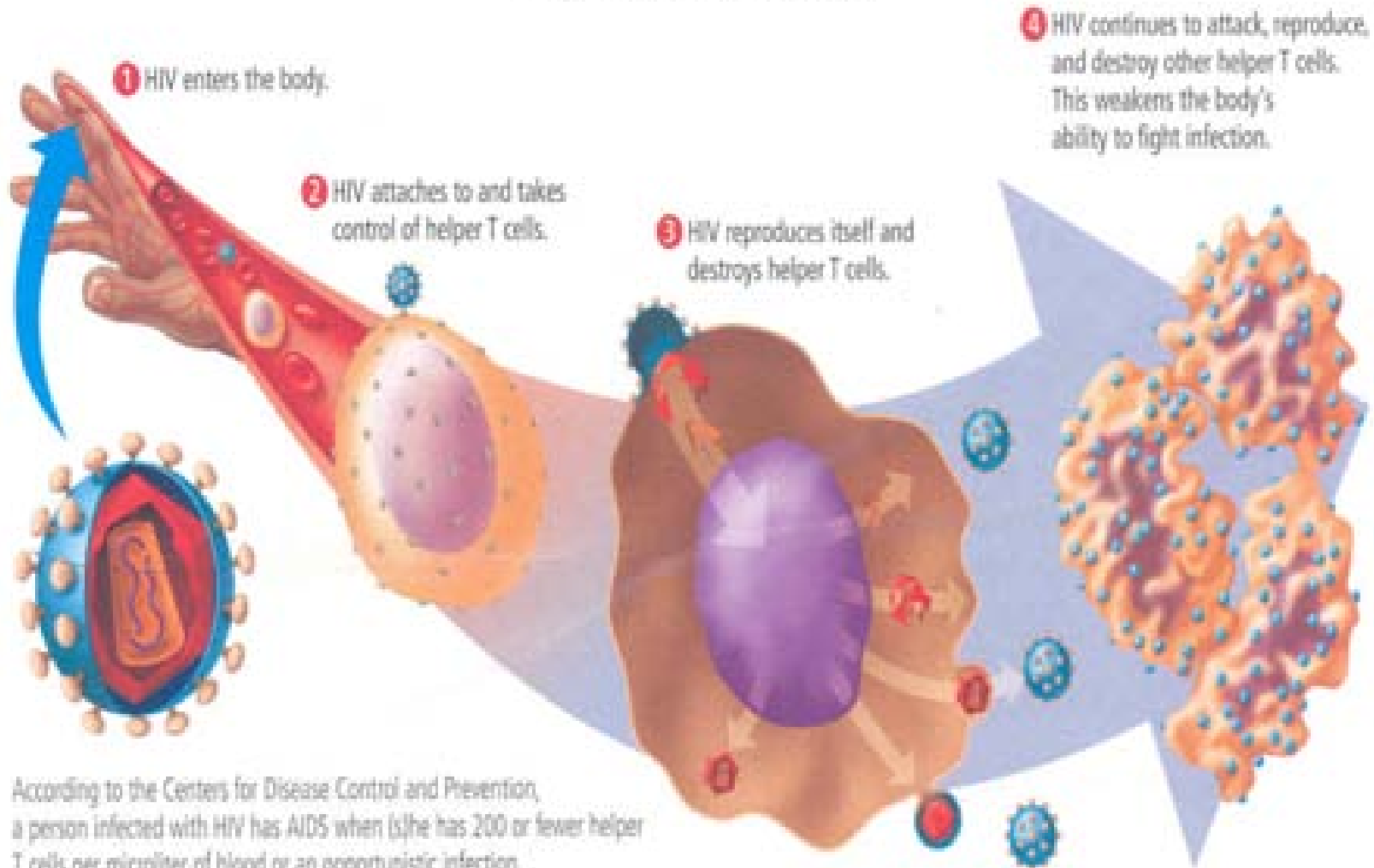
# REPRESENT



# Is this appropriate for a tactile graphic?

- ▶ Is the information a repeat of facts in the text?
- ▶ Would the information be more meaningful in text form?
- ▶ Does the graphic require the reader to use visual discrimination or visual perception??
- ▶ Should this be a tactile graphic **and** a TN?

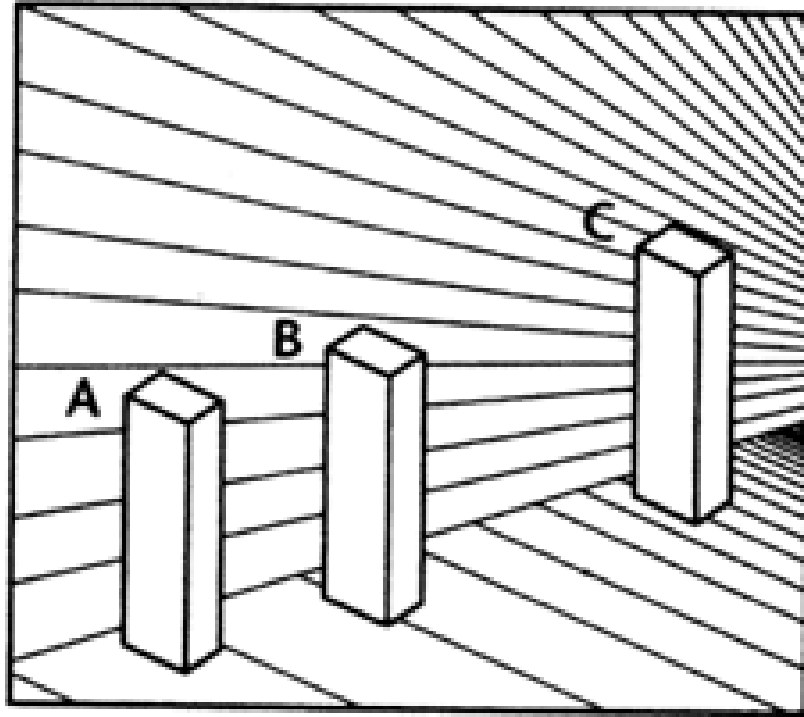
## When HIV Enters the Body



According to the Centers for Disease Control and Prevention, a person infected with HIV has AIDS when (s)he has 200 or fewer helper T cells per microliter of blood or an opportunistic infection.

# Guidelines for Describing STEM Images

[http://ncam.wgbh.org/  
experience\\_learn/  
educational\\_media/  
stemdx](http://ncam.wgbh.org/experience_learn/educational_media/stemdx)



**DON'T DO THIS AS A TACTILE GRAPHIC!**

# Planning and Editing

- ▶ Identify the content to be included
- ▶ Components of a graphic:
  - Area
  - Line
  - Point Symbol
  - Label
  - Key or legend



# Simplify

## 1. Eliminate

- unnecessary parts (map scale, rivers if not needed as land marks)
- complicated shapes that can be replaced with simpler ones (instead of counting bicycles, substitute a basic shape– circle, triangle, square)

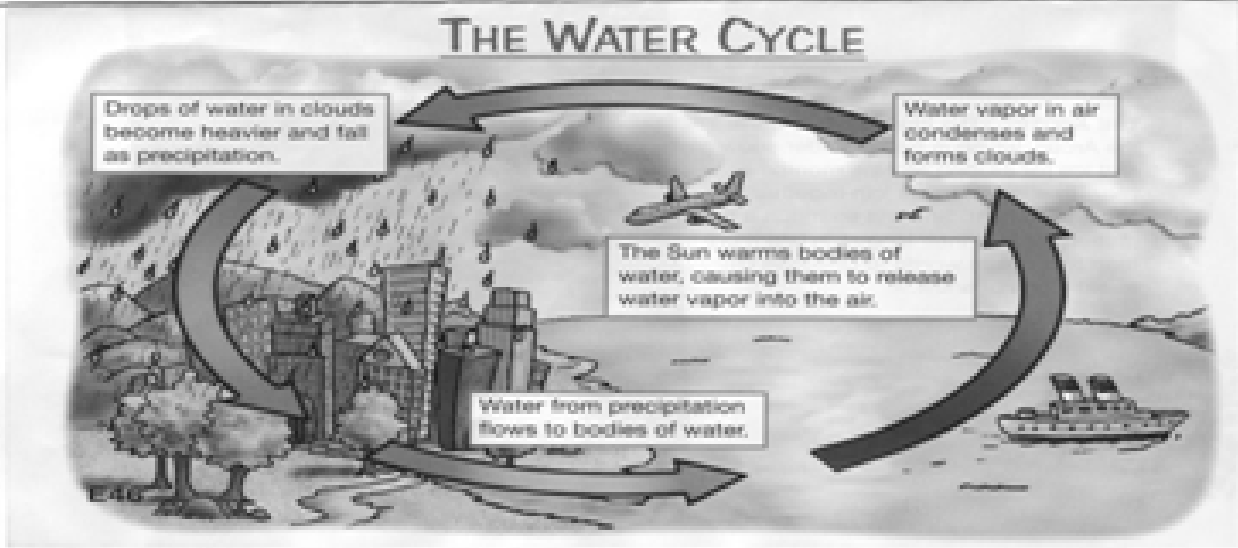
# THE WATER CYCLE

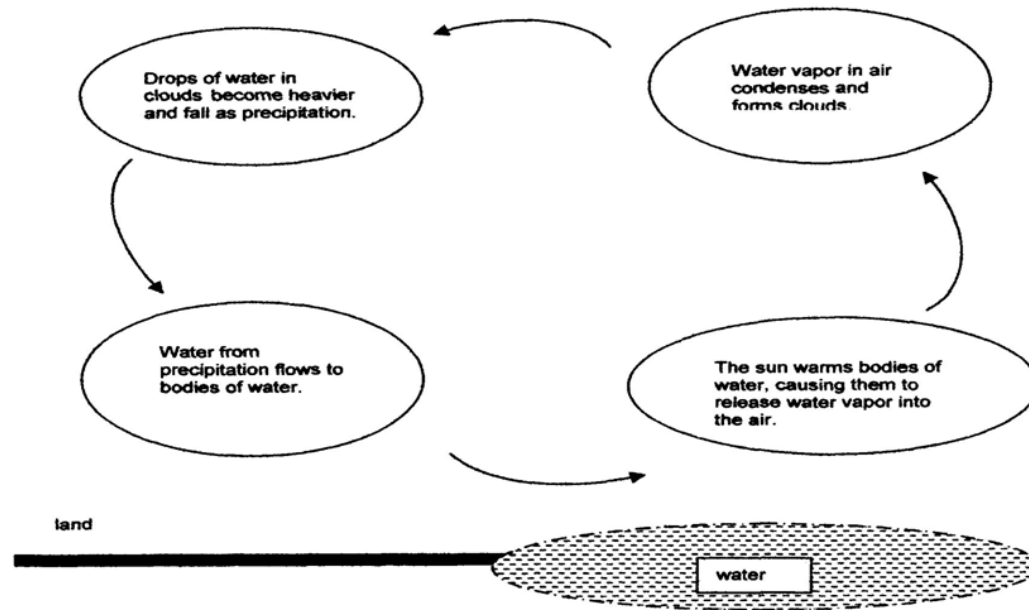
Drops of water in clouds become heavier and fall as precipitation.

Water vapor in air condenses and forms clouds.

The Sun warms bodies of water, causing them to release water vapor into the air.

Water from precipitation flows to bodies of water.



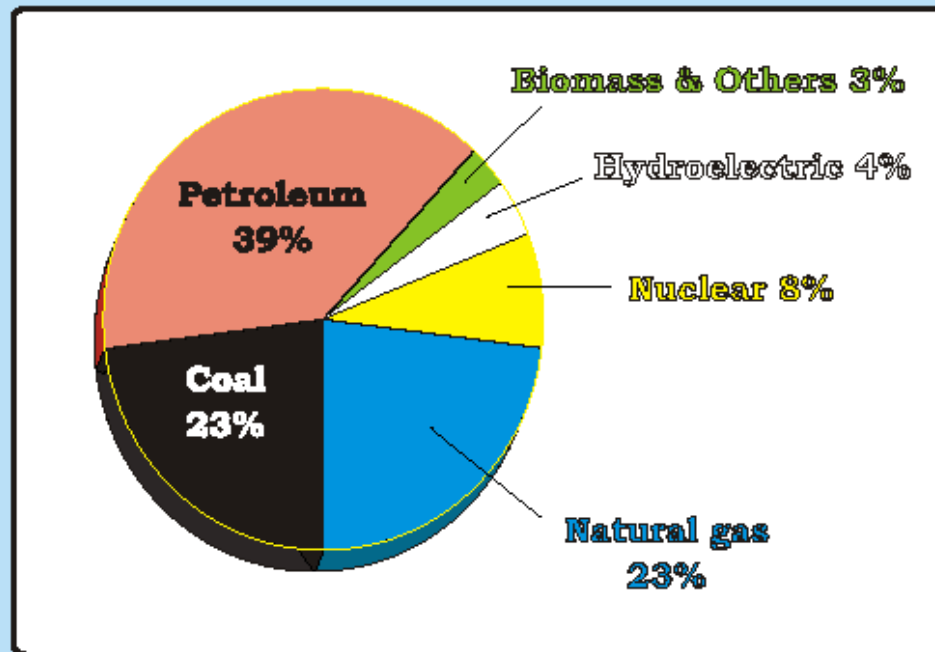


## EXAMPLE 20

**Figure 16**

**This circle graph shows the primary sources of energy used in the United States.**

### *Sources of Energy*



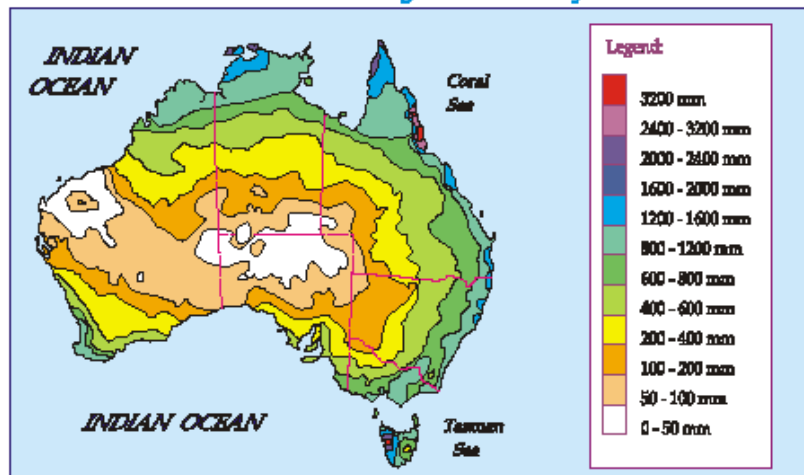
## 2. Consolidate

- similar features (islands, exports)
- areas of a range. Caution: must read text and any student activities to make sure the consolidation does not interfere with data student must identify or manipulate.

# EXAMPLE 5

Print Graphic:

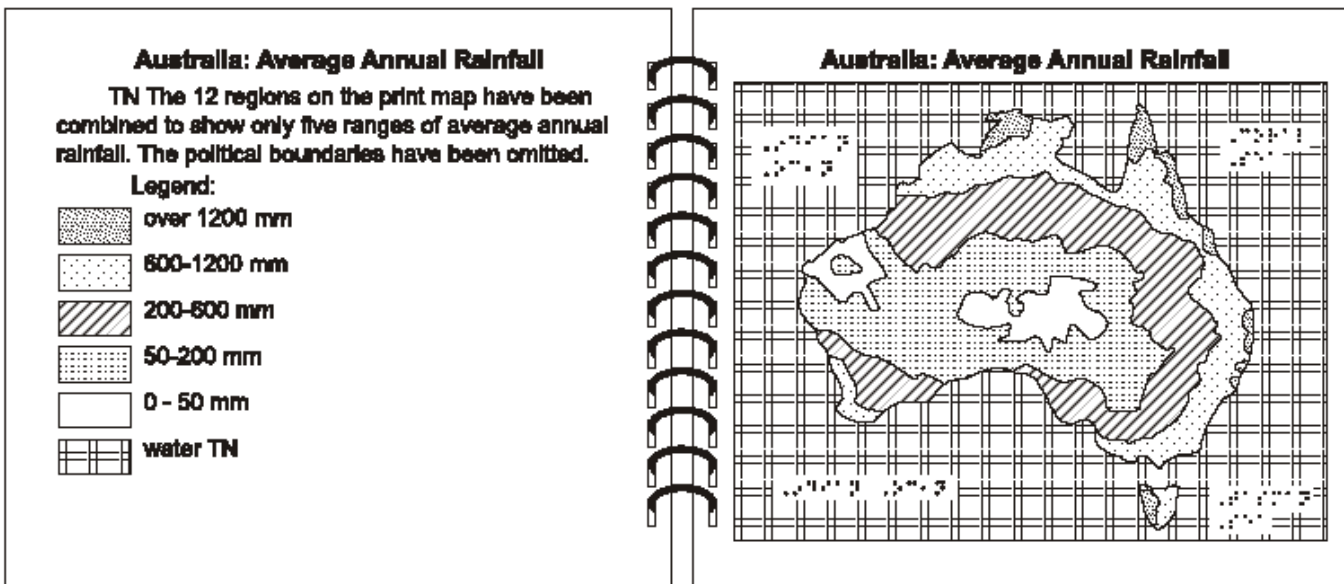
*Australia: Average Annual Rainfall*



Tactile Graphic:

Facing Key Page

Diagram Page



3. Distort if needed to provide tactile clarity (leaving additional space between a peninsula and mainland so that they can be seen as separate items)
4. Generalize outline shapes (smooth out shorelines)

## 5. **Separate complex diagrams by sections, categories, or layers**

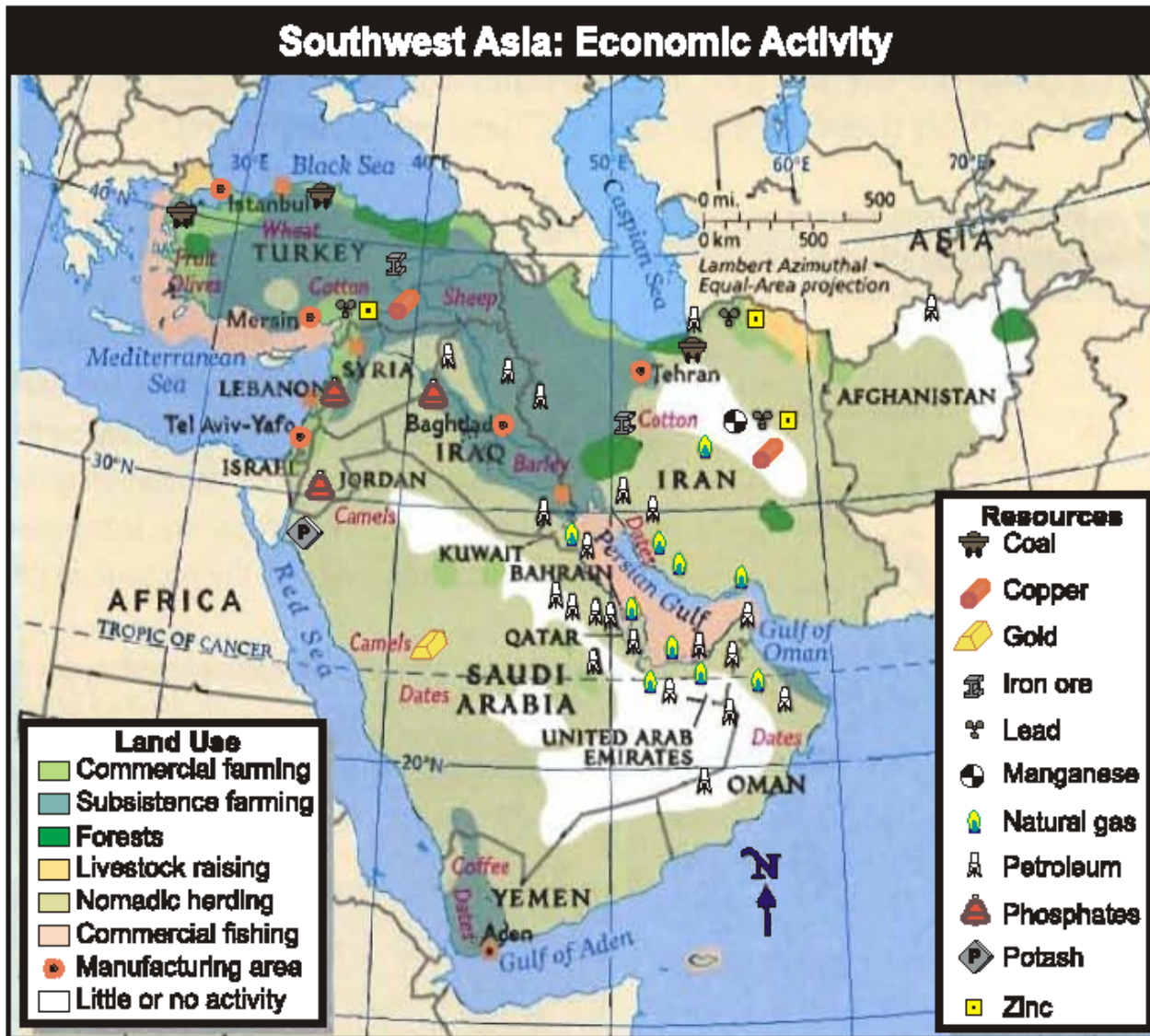
To put the separate parts back together into a whole picture, the reader needs

- ▶ a thumbnail or overview diagram
- ▶ a consistent point of reference on each section.



Lucia Hasty 10/2008

## EXAMPLE 32

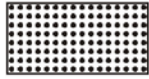


- ▶ 6. Change view from 3-D to 2-D if content allows. Show only a single side at a time.



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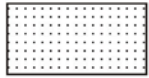
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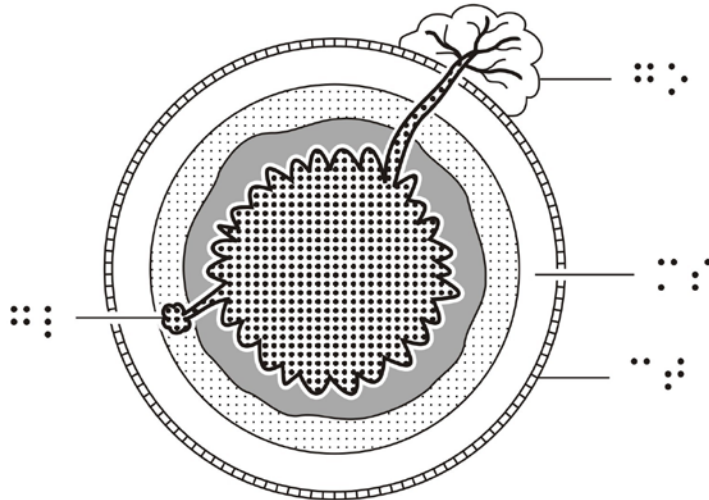


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7. Modify size, position, scale or layout if a clearer presentation can be made

8. Include some info in **key** instead of in diagram (e.g. capital city names)

# CHARACTERISTICS OF A READABLE TACTILE GRAPHIC

- ▶ Movement = Texture = Tactile perception
- ▶ Variety of heights
- ▶ Contrast between areas
- ▶ Simplicity
- ▶ 1 / 8 inch (absolute minimum) between line and label or point symbol. 1 / 4 inch may be required for clarity.