

LESSON 24 • OUTLINING SKILLS (LEVEL B)

CONSTRUCT A TEMPORARY OUTLINE AND ORGANIZE NOTE CARDS

Textbook Pages 31–32

Directions: Examine the 3 main topics in the **Skeleton Outline** below. Label each note card on the left with **I, II, or III**. Next, organize the notes to construct the complete hierarchical outline for "Clouds" on the right.

SKELETON OUTLINE:

I. Describe the three main types II. How are they formed III. How do they affect climate

NOTE CARD 1 Topic:

Cirrus clouds

- Resemble tails of horses
- Thin clouds made up of ice crystals

NOTE CARD 2 Topic:

Formed by evaporation of surface water

- Water then changes to vapor — a gas
- This gas needed to form clouds

NOTE CARD 3 Topic:

Cloudless skies in winter allow surface heat to escape

NOTE CARD 4 Topic:

Cumulus clouds

- Fluffy, cauliflower-shaped
- Form on top rapidly rising warm air currents

NOTE CARD 5 Topic:

Sun's short-wave radiation penetrates cloud covering

- Heats soil and ocean water
- Become long waves that cannot penetrate cloud layer
- Act as a blanket to hold heat trapped between clouds and ground

NOTE CARD 6 Topic:

By condensation

- Water vapor forms around many kinds of particles
- Vapor changes back to liquid to form droplets
- Enormous number of droplets combine to form clouds

NOTE CARD 7 Topic:

Stratus clouds

- Stretch in long, horizontal layers
- Signal slow, large scale, rising of air

NOTE CARD 8 Topic:

By cooling of air that hovers above Earth's surface

- Heated ground air expands and becomes lighter
- Heavier surrounding air forces it to rise

CLOUDS

I. Describe the three main types

A. _____

1. _____

2. _____

B. _____

1. _____

2. _____

C. _____

1. _____

2. _____

II. How are they formed

A. _____

1. _____

2. _____

B. _____

1. _____

2. _____

C. _____

1. _____

2. _____

3. _____

III. How do they affect climate

A. _____

1. _____

2. _____

3. _____

B. _____

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Lesson 24: Temporary Outline & Organize Note Cards (Clouds) • Student Page

Total: 32 Points (8 Cards + 24 Outline Elements)

LESSON 24: CONSTRUCT A TEMPORARY OUTLINE AND ORGANIZE NOTE CARDS

CLOUDS (MASTER HIERARCHICAL OUTLINE)

- I. Describe the three main types [Cards 1, 4, 7]
- A. Cirrus clouds
 - 1. Resemble tails of horses
 - 2. Thin clouds made up of ice crystals
 - B. Cumulus clouds
 - 1. Fluffy, cauliflower-shaped
 - 2. Form on top rapidly rising warm air currents
 - C. Stratus clouds
 - 1. Stretch in long, horizontal layers
 - 2. Signal slow, large scale, rising of air
- II. How are they formed [Cards 2, 8, 6]
- A. Formed by evaporation of surface water
 - 1. Water then changes to vapor – a gas
 - 2. This gas needed to form clouds
 - B. By cooling of air that hovers above Earth's surface
 - 1. Heated ground air expands and becomes lighter
 - 2. Heavier surrounding air forces it to rise
 - C. By condensation
 - 1. Water vapor forms around many kinds of particles
 - 2. Vapor changes back to liquid to form droplets
 - 3. Enormous number of droplets combine to form clouds
- III. How do they affect climate [Cards 5, 3]
- A. Sun's short-wave radiation penetrates cloud covering
 - 1. Heats soil and ocean water
 - 2. Become long waves that cannot penetrate cloud layer
 - 3. Act as a blanket to hold heat trapped between clouds and ground
 - B. Cloudless skies in winter allow surface heat to escape

MODEL 3-PARAGRAPH REPORT: CLOUDS AND THEIR CLIMATIC IMPACT

Paragraph 1 (The Three Main Types): Clouds exist in three primary morphological forms throughout the troposphere. First, cirrus clouds are delicate, wispy formations resembling horses' tails, situated at high altitudes and composed entirely of ice crystals. Second, cumulus clouds appear fluffy and cauliflower-shaped, generated atop energetic currents of rapidly rising warm air. Third, stratus clouds extend in vast, unbroken horizontal sheets, signaling widespread, gradual updrafts.

Paragraph 2 (Cloud Formation Lifecycle): The physical generation of clouds relies on a three-stage thermodynamic process. It begins with the evaporation of liquid surface water into water vapor gas. Next, heated air resting above the ground expands, becomes lighter, and is pushed aloft by heavier surrounding air currents to cool. Finally, condensation occurs as cooled vapor clings to atmospheric microscopic particles, transforming back into billions of minute liquid droplets that aggregate to form clouds.

Paragraph 3 (Global Climate & Thermal Insulation): Clouds fundamentally regulate Earth's thermal equilibrium by modulating solar radiation and planetary heat loss. Incoming short-wave solar radiation readily pierces cloud cover, warming surface continents and oceans. However, re-emitted terrestrial heat converts into long-wave thermal radiation that cannot pass back through the cloud ceiling, functioning like an insulating blanket that traps ambient heat. Conversely, during clear winter nights with cloudless skies, this surface warmth rapidly escapes into space.

Scientific Inquiry & Multi-Card Synthesis

Students synthesize 8 distinct scientific research cards into three logical domains: **Taxonomy** (I: Types), **Thermodynamic Process** (II: Formation lifecycle), and **Meteorological Impact** (III: Earth's greenhouse blanket).

3 Paragraphs from 3 Roman Numerals

The textbook requires a 3-paragraph report. This illustrates the core outlining rule: *Each Roman numeral forms the topic sentence and substantive core of exactly one well-developed expository paragraph.*

Card → Tier	Meteorological Concepts	Pedagogical Role & Textual Function
Cards 1, 4, 7 → I	Cirrus / Cumulus / Stratus types	Descriptive taxonomy: Shape, altitude, and physical constitution of 3 cloud classes.
Cards 2, 8, 6 → II	Evaporation → Cooling → Condensation	Sequential physical cause-and-effect: The 3 thermodynamic stages of cloud formation.
Cards 5, 3 → III	Radiation blanket & winter heat dissipation	Climatological analysis: How cloud opacity regulates global terrestrial thermodynamics.