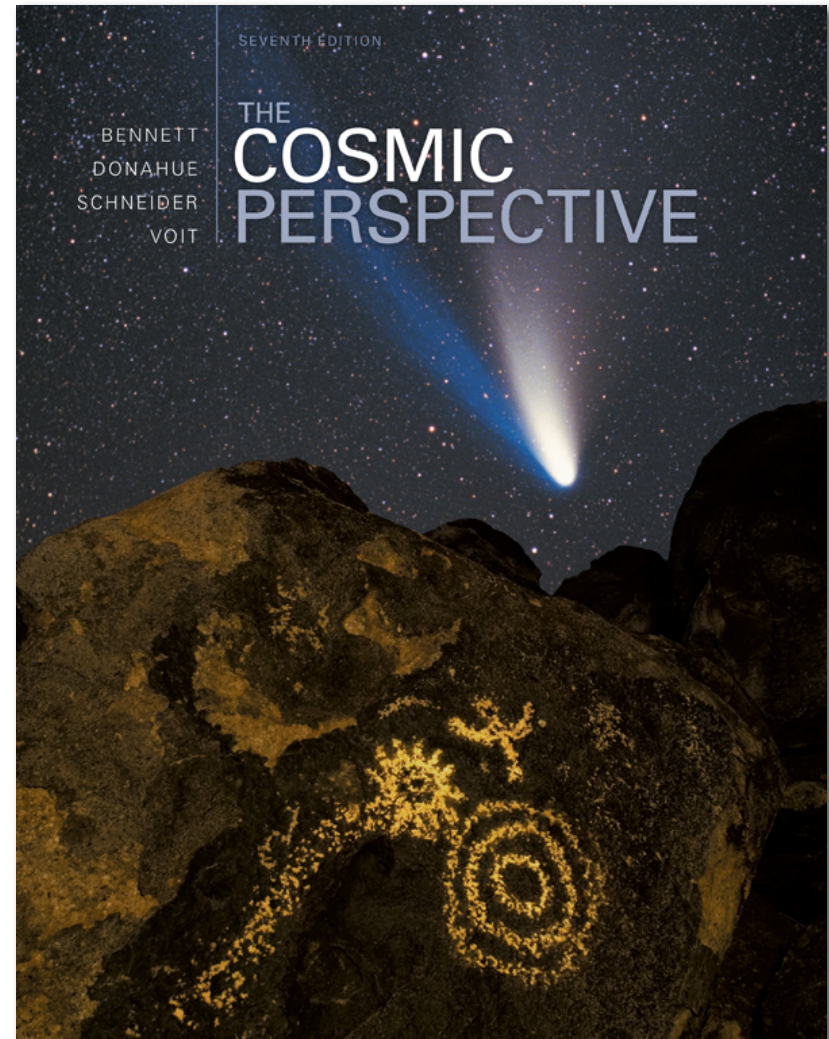


The Cosmic Perspective

Seventh Edition

Planetary Atmospheres: Earth and the Other Terrestrial Worlds



What are the main constituents of Earth's atmosphere?

- a) hydrogen and helium
- b) nitrogen and oxygen
- c) oxygen and carbon dioxide
- d) oxygen and carbon monoxide
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Why is atmospheric pressure less on top of a mountain than at sea level?

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- c) The pressure at every height in the atmosphere equals the weight of the air above it.
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- c) would be colder than freezing.
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If Earth didn't have an atmosphere, what would happen to its temperature?

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- b) It would go up a lot.
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- d) It would go down a lot.
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Which of the following correctly states the layers of Earth's atmosphere from closest to the surface to closest to space?

- a) troposphere, stratosphere, exosphere, thermosphere
- b) stratosphere, exosphere, thermosphere, troposphere
- c) troposphere, stratosphere, thermosphere, exosphere
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Infrared radiation emitted by Earth's surface

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- b) causes convection.
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The stratosphere is heated by

- a) warm air rising from the troposphere.
- b) ultraviolet light from the Sun.
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The sky is blue because

- a) of the reflection of the oceans.
- b) blue is the color of oxygen gas.
- c) blue is the color of nitrogen gas.
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What affects the global circulation pattern of Earth's atmosphere?

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- b) Earth's rotation
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What effects long-term climate change?

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Where did the hydrogen in Earth's atmosphere go?

- a) We never had any.
- b) It escaped into space.
- c) It dissolved in the oceans and was incorporated into rocks.
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Why do we think Mars was once warmer and wetter?

- a) It has plenty of volcanoes to outgas an atmosphere.
- b) It doesn't have strong magnetic field to protect from solar wind stripping.
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What is the main reason that Venus is warmer than Earth?

- a) Venus is closer to the Sun than Earth.
- b) Venus has a higher reflectivity than Earth.
- c) Venus has a lower reflectivity than Earth.
- d) The greenhouse effect is much higher on Venus than on Earth.
- e) Human presence on Earth has led to declining temperatures.

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Chapter 10

Suppose we could magically replace Venus' actual atmosphere with an atmosphere identical to Earth's. Could liquid water exist on its surface?

- a) No, the runaway greenhouse effect would ensure that liquid water would immediately evaporate.
- b) No, the low pressure would ensure that liquid water would immediately evaporate.
- c) Yes, the surface temperature would be well below the boiling point of water.
- d) Yes, the conditions would be exactly as on Earth.
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Suppose that, somehow, all plants died out. What would happen to the oxygen in our atmosphere?

- a) The oxygen would eventually be used up in oxidation reactions with the surface.
- b) The oxygen would initially decrease, but as greenhouse gases and temperature increased, it would recover to its normal value.
- c) The oxygen would increase as plants would not exist to remove it from the atmosphere.
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Surprising discovery? - A planet in another solar system that has an Earth-like atmosphere with plentiful oxygen, but no life of any kind.

- a) Plausible. Life requires far more than oxygen to exist.
- b) Plausible. The oxygen may have been transported there by cometary impacts.
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