Figure 3.26 Hallmarks of Science

Hallmarks of Science

- Seeks explanations for observed phenomena that rely solely on natural causes.
- Progresses through creation and testing of models of nature that explain the observations as simply as possible.
- Makes testable predictions about natural phenomena. If predictions do not agree with observations, model must be revised or abandoned.

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Figure 3.25 traditional scientific method

1. Observations
2. Question
3. Hypothesis
4. Prediction

Test *does not support* hypothesis; revise hypothesis or choose new one.

Test *supports* hypothesis; make additional predictions and test them.

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1 arc minute

1 arc degree

360 arc degrees in a full circle

1 arc second
Figure 4.3 & 4.4 Illustrations of temperature and heat

Longer arrows mean higher average speed.

Ideal Gas Law

\[ PV = nRT \]

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Figure 4.8 phases of matter

Fully ionized plasma.
Atoms in plasma become increasingly ionized.

**Plasma Phase**
Free electrons move among positively charged ions.

Molecular dissociation into component atoms.

**Gas Phase**
Atoms or molecules move essentially unconstrained.

**Liquid Phase**
Atoms or molecules remain together but move relatively freely.

**Solid Phase**
Atoms or molecules are held tightly in place.

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