

# Science ISAT: General Science – Physical Science

## Skills: Understand the Structure of Atoms

**Students:**

**RIT Above 250:**

- None

**Students:**

**RIT 241-250:**

- None

**Students:**

**RIT 231-240:**

- Determines the number of neutrons in an atom of an element given the atomic mass of the element
- Interprets data related to electron configuration
- Explains how a magnet can be used to produce electric current

**Students:**

**RIT 221-230:**

- Recognizes that atomic number represents the number of protons found in the nucleus of a particular type of element
- Describes the relationship between atomic number and atomic mass
- Determines the number of protons in an atom of an element when given that atom's atomic number
- Determines the number of neutrons in an atom of an element given the atomic mass of the element
- Determines the atomic mass of an atom, given the number of protons, electrons and neutrons for this atom
- Describes the electron cloud (quantum) model of atomic structure
- Makes predictions of reactivity based on electron configuration
- Determines the electrical charge of an atom or ion
- Recognizes that for an element, the number of protons and electrons remains the same, but the number of neutrons may vary
- Differentiates between parallel and series circuits
- Explains that negatively charged materials have an excess of negative charges
- Describes properties of magnets
- Determines the polarity of a magnet based on its interaction with other magnets
- Explains how to build a simple compass
- Describes the usefulness of a compass to detect magnetic fields
- Describes magnetic fields
- Describes ways to increase the strength of an electromagnet

**Students:**

**RIT 211-220:**

- Describes how elements are ordered by atomic number in the periodic table
- Determines the number of neutrons in an atom of an element given the atomic mass of the element
- Recognizes the subatomic structure of the atom
- Describes the locations where each atomic particle may be found
- Understands that the nucleus consists of protons and neutrons
- Explains that all matter is made of tiny particles called atoms
- Uses models to show the structure of the atom
- Recognizes that atoms interact by transferring or sharing valence electrons
- Compares electrical conducting ability of various materials
- Analyzes series circuits
- Uses analogies to explain the flow of current in an electrical wire
- Describes hazards of radioactivity
- Makes comparisons related to static electricity
- Describes the usefulness of a compass to detect magnetic fields
- Describes magnetic fields

**Students:**

**RIT 201-210:**

- Describes characteristics of each subatomic particle
- Explains that all matter is made of tiny particles called atoms
- Recognizes that atoms are composed of smaller particles (e.g., protons, neutrons, and electrons)
- Analyzes direct current electrical circuits
- Gives examples of electrical insulators
- Analyzes the parts of a light bulb
- Distinguishes between open and closed circuits
- Explains how fuses are used in electrical circuits
- Explains why magnets attract or repel other magnets
- Recognizes that like poles of magnets will repel and that unlike poles will attract
- Explains that a compass needle will align to Earth's magnetic north and south poles
- Explains why a compass can be used to find north

## Science ISAT: General Science – Physical Science

### Skills: Understand the Structure of Atoms

#### Students:

#### RIT 191-200:

- Classifies materials according to their magnetism
- Explains that all matter is made of tiny particles called atoms
- Compares electrical insulating ability of different materials
- Gives examples of electrical conductors
- Analyzes parallel circuits
- Makes inferences about the working of circuits
- Recognizes a simple circuit
- Recognizes that an electrically charged substance will attract or repel other charged materials
- Gives examples of static electricity
- Analyzes the charging of objects due to transfer of electrons by friction
- Recognizes that magnets' forces can pass through paper, glass, and water
- Selects evidence that supports the idea that magnets attract only some kinds of metal
- Makes predictions about the interaction of magnets

#### Students:

#### RIT 181-190:

- Classifies materials according to their magnetism
- Recognizes that magnets can move some things without touching them
- Generalizes that magnets attract only certain types of metals (e.g., iron)
- Recognizes that magnets attract certain other types of materials
- Recognizes that electricity creates magnetic fields
- Describes sources of magnetic fields