

Science ISAT: Concepts and Processes – Nature of Science

Skills: Understand Constancy, Change, and Measurement

Students:	<p>RIT Above 240:</p> <ul style="list-style-type: none"> • Gives examples of dynamic equilibrium in systems • Infers that things that have come to rest are in equilibrium
Students:	<p>RIT 231-240:</p> <ul style="list-style-type: none"> • Explains that equilibrium can be produced when changes occur in opposition to each other and at the same time • Infers that a system is in balance due to forces equally opposing each other • Recognizes examples of dynamic equilibrium in systems • Infers that things that have come to rest are in equilibrium • Classifies disparate events as examples of equilibrium • Determines gradients of change to systems when given a table of relevant data • Gives examples of gradient change • Gives examples of evolutionary change • Uses symbolic equations to represent change • Classifies statements as qualitative observations
Students:	<p>RIT 221-230:</p> <ul style="list-style-type: none"> • Explains that equilibrium can be produced when changes occur in opposition to each other and at the same time • Gives examples of maintenance of equilibrium (homeostasis) in the human body • Describes characteristics of a gradient • Gives examples of cyclic events • Determines evolutionary trends in Earth/space, physical, and biological systems • Classifies statements as quantitative observations
Students:	<p>RIT 211-220:</p> <ul style="list-style-type: none"> • Gives examples of equilibrium in systems • Predicts how a particular change will affect the equilibrium of a system • Gives examples of systems which show balance • Analyzes changes occurring within systems • Gives examples of things in nature which do not change • Determines the rate or gradient of change in systems, when given length of time and a total measurement of change • Predicts patterns of change to systems • Extrapolates using rate of change to a system • Distinguishes cycles from non-cyclic events • Understands that events that occur regularly are called cyclic • Understands that rates describe the time it takes for a unit of a given event to occur • Analyzes changes in scale • Understands that correlations seen in data are most useful in making predictions when a cause-effect relationship is established • Measures the temperature shown on a thermometer, using interpolation • Estimates length when given a ruler smaller than the object being measured • Chooses the appropriate tools to measure mass • Chooses the appropriate tools to measure volume • Measures the temperature shown on a thermometer (negative numbers) • Classifies statements as quantitative observations • Understands that quantitative observations are often more precise than qualitative observations • Understands that precise measurements are an accurate, specific description of quantity, not estimations of quantity • Explains that the more accurate a tool
Students:	<p>RIT 201-210:</p> <ul style="list-style-type: none"> • Gives examples of equilibrium in systems • Classifies a given event as an example of equilibrium • Understands that counterbalancing changes may be needed for systems to be maintained as conditions change • Explains how systems remain in equilibrium • Predicts how a particular change will affect the equilibrium of a system • Gives examples of events that are likely to cause disequilibrium in a system (terms not used) • Explains that very fast and very slow changes can be difficult to see or measure • Represents change quantitatively • Explains that change in nature is common and widespread • Classifies events as change • Describes properties of matter that remain constant after changes to systems • Determines the rate or gradient of change in systems, when given length of time and a total measurement of change • Determines the location or time that a particular change is likely to occur when given the rate of change to a system

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Skills: Understand Constancy, Change, and Measurement

- Predicts what comes next in a sequence of numbers showing a complex pattern (e.g., addition then subtraction, geometric progression)
- Gives evidence that supports the conclusion that a system (man-made or natural) has changed or evolved over time
- Understands that evolution refers to changes to an entire species, not changes to an individual
- Describes characteristics of evolution
- Makes inferences about the evolution of a system, given data about that system
- Interprets data (diagrams) related to the evolution of a system
- Understands that rates describe the time it takes for a unit of a given event to occur
- Analyzes changes in scale
- Understands that things that change over time can be measured
- Measures the temperature shown on a thermometer, using interpolation
- Chooses the appropriate tools to measure the speed of an object
- Understands that quantitative observations are often more precise than qualitative observations

Students:

RIT 191-200:

- Gives examples of events that are likely to cause disequilibrium in a system (terms not used)
- Describes a constant rate of change for a familiar system
- Describes changes that have occurred in a system
- Classifies events as change
- Explains what caused a particular change in a common system to occur
- Describes the importance of direct observation in determining the cause of change to systems
- Gives real life examples of things that remain constant
- Infers what is missing in sequences of patterns or events
- Extends patterns found in nature
- Predicts what comes next in a sequence of numbers showing a complex pattern (e.g., addition then subtraction, geometric progression)
- Gives examples of cycles
- Understands that patterns that recur regularly are called cycles
- Infers what step is missing from a cycle showing repetitive change
- Understands that a cycle may have no beginning or end, but events within the cycle will proceed in a predictable fashion
- Understands that recognizing an event is cyclic can help us prepare for the future
- Gives examples of a cause and effect relationship
- Explains how determining cause and effect relationships can be useful
- Classifies a given scenario as an example of cause and effect
- Infers the possible causes for a given scenario (presented as a diagram)
- Understands that some things (e.g., color) are difficult to measure
- Measures using non-standard units
- Measures the temperature shown on a thermometer (positive numbers)
- Measures length using a ruler
- Chooses the appropriate tools to observe objects
- Reads the weight shown on a spring scale
- Chooses the appropriate unit to measure length

Students:

RIT 181-190:

- Describes changes that have occurred in a system
- Explains what caused a particular change in a common system to occur
- Predicts the next step for a given cycle (term not used)
- Determines causes for a given effect
- Predicts effects of a particular action
- Measures using non-standard units
- Chooses the appropriate tools to measure length, height, or distance
- Chooses the appropriate tool to measure how hot an object is
- Understands that measuring tools can be used to improve the accuracy of an estimate

Students:

RIT 171-180:

- Describes ways in which things can change
- Describes variables that cause change
- Identifies qualitative change in systems, given the conditions that occur before, during, and after an event
- Predicts what comes next in sequences of objects or events
- Describes the sequence of elements within a pattern
- Determines causes for a given effect
- Predicts effects of a particular action
- Describes the purpose of a ruler
- Understands the importance of counting (e.g., quantifying) in determining the properties of an item

Students:

RIT Below 171:

- *No Skills Listed*