

Science at ISUtrecht

The Role Play phase can span from kindergarten to grade 2. A student is in the Role play phase when the student displays any of these indicators:

- Share observations with others and communicating their experiences
- Use sight, hearing, touch, taste and smell so that students can gather information about the world around them
- Use drawings to represent observations and ideas and discussing their representations with others
- Work in groups to describe what students have done and what they have found out
- Communicate ideas through role play and drawing
- Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.
- Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.
- Identify and describe the basic structure of common flowering plants, including trees.
- Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.
- Identify and name a variety of common animals that are carnivores, herbivores and omnivores.
- Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)
- Understand daily and seasonal changes in our environment affect everyday life
- Observe changes across the four seasons
- Observe and describe weather associated with the seasons and how day length varies.
- Demonstrate the ability to observe their immediate environment
- Describe features of their immediate environment
- Identify materials that make up familiar objects
- Describe ways to rethink, refuse, reduce, reuse, and recycle
- Observe, describe, and compare physical and chemical properties of common materials and changes that occur when materials are mixed, heated, or cooled.
- Distinguish between an object and the material from which it is made
- Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock
- Describe the simple physical properties of a variety of everyday materials
- Compare and group together a variety of everyday materials on the basis of their simple physical properties.

- Use appropriate vocabulary related to their investigations of colours
- Describe how the distance between an object and its light source affects the size of a shadow
- Sort and classify objects by color

The Experimental phase can span from kindergarten to grade 3. In the Experimental phase for science, the student demonstrates all the following indicators:

- Jointly construct questions about scientific inquiry with teacher guidance
- Use the senses to explore the local environment to pose interesting questions and making predictions about what will happen
- Manipulate objects and making observations of what happens
- Sort information and classifying objects based on easily observable characteristics with teacher guidance
- Use units that are familiar to students from home and school, such as cups (cooking), hand spans (length) and walking paces (distance) to make and record observations with teacher guidance
- Use matching activities, including identifying similar things, odd-one-out and opposites
- Discuss original predictions and, with guidance, comparing these to their observations
- Jointly construct simple column graphs and picture graphs to represent class investigations
- Discuss observations as a whole class to identify similarities and differences in their observations
- Discuss or represent what was discovered in an investigation
- Describe how animals are important in the lives of people.
- Describe the basic needs of local plants and animals.
- Describe how habitats provide for the basic needs of different kinds of animals and plants and how they depend on each other and the environment.
- Explain how living things are suited to their particular habitat and how they respond to environmental changes, both natural and human induced.
- Explain how we know that some living things from the past are now extinct.
- Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.
- Describe, and represent patterns and trends for everyday examples of physical phenomena, such as movement, forces, sound, and waves.
- Demonstrate how force can be applied to move an object.

- Compare the effect of friction on the movement of an object over a variety of surfaces.
- Demonstrate and describe the effects of magnets on different materials.

The Early phase can span from grade 1 to grade 5. In the Early phase for science, the student demonstrates all the following indicators:

- Use the senses to explore the local environment to pose interesting questions, make inferences and predictions
- Manipulate objects and materials and make observations of the results
- Sort objects and events based on easily identified characteristics
- Construct column and picture graphs with teacher guidance to record gathered information
- Compare and discuss, with guidance, whether observations were expected
- Sort information in provided tables or graphic organisers
- Discuss observations with other students to see similarities and differences in results
- Identify that humans and some other animals have skeletons and muscles for support, protection and movement.
- Describe the importance for humans of exercise, eating the right amounts of different types of food and hygiene.
- Make and record observations of living things as they develop through their life cycles.
- Classify familiar animals according to similarities and differences in appearance, behaviour, and life cycles
- Compare familiar plants according to similarities and differences in appearance and life cycles
- Know that different kinds of animals have different life cycles
- Know animals' characteristics (e.g., skin covering) help them adapt to the conditions in their environment
- Know animals have behaviours such as hibernation and migration and that these help them adapt to seasonal conditions in their environment
- Observe and record the life cycles of a variety of animals
- Predict and infer the stages in the life cycles of related animals
- Make inferences about an animal's environment from its characteristics
- Use facts and observations to draw conclusions about animal populations
- Identify the Earth's resources including water, soil and minerals, and describing how they are used in the school.
- Describe how a resource is transferred from its source to its point of use.
- Identify actions at school and home, that can conserve resources.
- Compare renewable and non-renewable energy sources.
- compare the effects of different materials, shapes, and forces on the strength and stability of different structures
- Describe shapes that are part of natural and human-built structures (e.g., domes, arches, pyramids)

- Use appropriate vocabulary related to their investigations of materials and structures.

The Transitional phase can span from grade 3 to secondary. In the Transitional phase for science, the student demonstrates all the following indicators:

- Decide what characteristics make a material a pollutant
- Choose questions to investigate from a list of possibilities
- Jointly construct questions that may form the basis for investigation
- List shared experiences as a whole class and identifying possible investigations
- Work in groups to discuss things that might happen during an investigation
- Work with teacher guidance to plan investigations to test simple cause-and-effect relationships
- Discuss, as a whole class, ways to investigate questions and evaluating which ways might be most successful
- Discuss safety rules for equipment and procedures
- Record measurements using familiar formal units and appropriate abbreviations, such as seconds (s), grams (g), centimetres (cm)
- Use a variety of tools to make observations, such as digital cameras, thermometers, rulers and scales
- Use a range of methods including tables and simple column graphs to represent data and to identify patterns and trends
- Compare results with predictions, suggesting possible reasons for findings
- Reflect on investigations, including whether a test was fair or not
- Represent and communicate observations, ideas and findings using formal and informal representations
- Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
- Describe how plants are harvested and used throughout the seasons.
- Observe qualitatively how speed is affected by the size of a force.
- Compare and contrast the effect of friction on different surfaces, such as tyres and shoes on a range of surfaces.

The Conventional phase can span from grade 4 to secondary. In the Conventional phase for science, the student demonstrates all the following indicators:

- With guidance, pose clarifying questions and make predictions about scientific investigations
- Identify, plan and apply the elements of scientific investigations to answer questions and solve problems using equipment and materials safely and identifying potential risks
- Decide variables to be changed and measured in fair tests, and observe measure and record data with accuracy using digital technologies as appropriate
- Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate
- Compare data with predictions and use as evidence in developing explanations
- Reflect on and suggest improvements to scientific investigations
- Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multi-modal texts
- Construct and interpret a variety of food chains, identifying producers, predators and prey.
- Compare the structures and behaviours of local animals and plants in different habitats and communities.
- Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.
- Describe the movement of the Moon relative to the Earth.
- Describe the Sun, Earth and Moon as approximately spherical bodies.
- Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.
- Describe characteristics and movements of objects in our solar system.
- Compare familiar constellations in seasonal skies.
- Explain the importance of variation within a changing environment.
- Investigating the characteristics of soils.
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- Describe the Sun, Earth and Moon as approximately spherical bodies.
- Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.
- Describe characteristics and movements of objects in our solar system.
- Compare familiar constellations in seasonal skies.
- Explain the importance of variation within a changing environment.
- Identify common appliances that run on electricity

- Demonstrate that electricity can be transformed into light, heat, sound, motion, and magnetic effects
- Differentiate between renewable and non-renewable methods of producing electrical energy