

Kenilworth Public Schools

Curriculum Guide

Content Area: Science

Grade: 2

BOE Approved: 7/11/2016

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Submitted by: Nicole Collemi

BOE Revision Approved: 2/14/22

Science - Grade 2 Scope and Sequence

| Unit 1- Physical Science Matter & Interactions | Unit 2- Earth & Space Science Pebbles, Sand & Silt | Unit 3- Life Science Plants & Animals |
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| 6-8 Weeks | 6-8 Weeks | 6-8 Weeks |
| <p><i>Unit Description:</i></p> <p>Students will observe, describe, and compare properties of solids and liquids. They will discover what happens when solids and water are mixed and when liquids and water are mixed. They will gain an understanding of changes caused by heating and cooling.</p> | <p><i>Unit Description:</i></p> <p>Students will observe structures and properties of earth materials (rocks, soil, and water), weathering and erosion of Earth’s surface, natural sources of water, and represent the types of land and bodies of water on Earth.</p> | <p><i>Unit Description:</i></p> <p>Students will observe the structures of plants and discover ways to propagate new plants from mature plants (from seeds, bulbs, roots, and stem cuttings). They will observe and describe changes that occur as plants grow. They will understand how habitat systems provide for the needs of both plants and animals. They will explore variation in the same kind of organism, including variation between young and adults. They will learn about the behavior of animals and their young and how these behaviors help the young survive.</p> |
| <p><i>Unit Targets:</i></p> <ul style="list-style-type: none"> • Solid is one state or phase of matter. • Objects are described and identified by their Properties. • Objects are made of one or more materials. • Natural and human-made objects occur outdoors. • Liquid is one common state of matter. • Liquids move freely in containers. • Liquids have many properties that help | <p><i>Unit Targets:</i></p> <ul style="list-style-type: none"> • Rocks can be described by their properties. • Smaller rocks (sand) result from the breaking (weathering) of larger rocks. • Rocks are the solid material of Earth. • Rocks are composed of minerals. • Volcanoes are mountains built up by melted rocks that flow out of weak areas in Earth’s crust. | <p><i>Unit Targets:</i></p> <ul style="list-style-type: none"> • Seeds need water to grow into new plants. • Not all plants grow alike. • Plant roots take in water and nutrients, and leaves make food from sunlight. • Seeds are alive and grow into new plants. • Plants have different structures that function in growth and survival. • Individuals of the same kind (of plant or animal) |

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| <p>identify them.</p> <ul style="list-style-type: none"> • Liquids take the shape of their containers. • The surfaces of liquids are flat and level. • Liquids pour and flow. • Solid materials can occur as masses of small particles. • A mass of particulate matter can form piles and support a denser object on its surface. • Particulate solids can be separated by size (with screens). • Masses of particulate matter can pour. • The surface of a mass of particles is not flat and level. • Particulate matter occurs naturally in the outdoors. • Some solids change when mixed with water. • Some solids dissolve in water. • Water can be separated from a mixture through evaporation; evaporation leaves the solid behind. • Some liquids mix with water; others form layers. • Some materials have properties of both solids and liquids. • Melting is the change from solid to liquid. • Freezing is the change from liquid to solid. • Heat causes materials to melt; cold causes them to freeze; changes can be reversible or irreversible. | <ul style="list-style-type: none"> • Rocks are earth materials. • Rocks can be described by the property of size. • Rock sizes include clay, silt, sand, gravel, pebbles, cobbles, and boulders. • Weathering, caused by wind or water, causes larger rocks to break into small rocks. • Some Earth events happen rapidly; others occur slowly over a very long period of time. • Earth materials are natural resources. • The properties of different earth materials make each suitable for specific uses. • Different sizes of sand are used on sandpaper to change the surface of wood from rough to smooth. • Earth materials are commonly used in the construction of buildings and streets. Earth materials are natural resources. • Soils can be described by their properties (color, texture, ability to support plant growth). • Soil is made partly from weathered rock and partly from organic material. Soils vary by location. • Natural sources of water include streams, rivers, ponds, lakes, marshes, and the ocean. Sources of water can be fresh or salt water. • Water can be a solid, liquid, or gas. • Wind and water can change the shape of land. • The shapes and kinds of land and water can be represented by various models. | <p>look similar but also vary in many ways.</p> <ul style="list-style-type: none"> • Leaves, twigs, and roots develop on stems at nodes. • Potatoes are underground stems; potato eyes are nodes where buds grow. • New plants can grow from the stems of mature plants. • Plants are living organisms that need, water, air, nutrients, light, and space to grow. • Plants need water, nutrients, air, space, and light; animals need water, food, air, and space with shelter. • A habitat is a place where plants and animals live. It provides what a plant or animal needs to live. • Plants and animals live in different environments and have structures and behaviors that help them survive. Animals use sensory structures to take in information about their surroundings and act on it. • Engineers learn from nature to solve problems. Plant bulbs are alive and grow new structures when provided with water. • Some parts of roots will grow into new plants if they are provided with water. Other parts will not. • Plants grow and change. Plants can produce. |
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Science Grade 2 Earth & Space Science Unit

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| Unit Title: Pebbles, Sand and Silt | |
| Unit Summary: Students will observe structures and properties of earth materials (rocks, soil, and water), weathering and erosion of Earth’s surface, natural sources of water, and represent the types of land and bodies of water on Earth. | |
| Primary Interdisciplinary Connections: ELA: RI.2.1-3, RI.2.9, W.2.6-8, SL.2.2, SL.2.5 Mathematics: MP.2, MP.4-5, 2.NBT.A, 2.NBT.A.3, 2.MD.B.5, 2.MD.D.10 | |
| Career Readiness, Life Literacies, and Key Skills: 9.1.2.CR.1-2; 9.1.2. FI.1; 9.1.2.FP.13; 9.1.2.PB.1-2; 9.1.2.RM.1; 9.1.2.CAP.1-4; 9.4.2.CI.1-2; 9.4.2.CT.1-3; 9.4.2.DC.1-7; 9.4.2.GCA:1; 9.4.2.IML.1-4; 9.4.2.TL.1-7 | |
| Learning Targets | |
| NJSLS Standards: 2-LS2-1, 2-LS2-2, 2-ESS1-1, 2-ESS2-1, 2-ESS2-2, 2-ESS2-3, K-2-ETS1-1, ETS1-2 ETS1-3 | |
| Computer Science and Design Thinking Standards: 8.1.2.CS.1-3; 8.1.5.NI.1-4; 8.1.2.IC.1; 8.1.2.DA.1-4; 8.1.2.AP.1-6; 8.2.2.ED.1-4; 8.2.2.ITH.1-5; 8.2.2.NT.1-2; 8.2.2.ETW.1-4; 8.2.2.EC.1 | |
| Climate Change Standards: | |
| <ul style="list-style-type: none"> • Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change to define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1) • Engaging in argument from evidence in K-2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s) by constructing an argument with evidence to support a claim (2-PS1-4) | |
| Content Statements: | |
| 1 | LS2.A: Interdependent relationships in ecosystems |
| 2 | ETS1.B: Developing possible solutions |
| 3 | ESS1.C: The history of planet earth |
| 4 | ESS2.A: Earth materials and systems |
| 5 | ESS2-B: Plate tectonics and large-scale system interactions |
| 6 | ESS2.C: The roles of water in Earth’s surface processes |
| 7 | ETS1.C: Optimizing the design solutions |
| Big Idea: The properties of solid earth materials make them suited to different purposes. Wind and water change the shape of the land and affect the process of erosion. Earth materials play an important role as natural resources. | |
| Unit Essential Questions: | Unit Enduring Understandings: |
| • How can rocks be described? | • Rocks are the solid materials of Earth that can |

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| <ul style="list-style-type: none"> • What are the different ways rocks can be sorted? • How do people use earth materials? • What is soil? • Where is water found in communities? | <p>be described by their properties.</p> <ul style="list-style-type: none"> • Rocks can be sorted by their size including clay, silt, sand, gravel, pebbles, cobbles, and boulders. • Earth materials are natural resources whose different properties make each suitable for specific uses. • Soils can be described by their properties (color, texture, ability to support plant growth) and are made partly from weathered rock and partly from organic material. Soils vary by Science Grade 2 Earth & Space Science Unit location. • Natural sources of water include streams, rivers, ponds, lakes, marshes, and the ocean. Sources of water can be fresh or salt water. |
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Unit Learning Targets

Students will...

- Rocks can be described by their properties.
- Smaller rocks (sand) result from the breaking (weathering) of larger rocks.
- Rocks are the solid material of Earth.
- Rocks are composed of minerals.
- Volcanoes are mountains built up by melted rocks that flow out of weak areas in Earth’s crust.
- Rocks are earth materials.
- Rocks can be described by the property of size.
- Rock sizes include clay, silt, sand, gravel, pebbles, cobbles, and boulders.
- Weathering, caused by wind or water, causes larger rocks to break into small rocks.
- Some Earth events happen rapidly; others occur slowly over a very long period of time.
- Earth materials are natural resources.
- The properties of different earth materials make each suitable for specific uses.
- Different sizes of sand are used on sandpaper to change the surface of wood from rough to smooth.
- Earth materials are commonly used in the construction of buildings and streets. Earth materials are natural resources.
- Soils can be described by their properties (color, texture, ability to support plant growth).
- Soil is made partly from weathered rock and partly from organic material. Soils vary by location.
- Natural sources of water include streams, rivers, ponds, lakes, marshes, and the ocean. Sources of water can be fresh or salt water.
- Water can be a solid, liquid, or gas.
- Wind and water can change the shape of land.
- The shapes and kinds of land and water can be represented by various models.

Evidence of Learning

Summative Assessment: Foss kit Investigation I-Checks (benchmark assessments)

Formative Assessments:

- Student's Science notebooks
- Foss labs

Lesson Plans

Activities/Interdisciplinary Connections

Timeframe

- FOSS Investigations: First Rocks 1.1 - 1.5
- FOSS Investigations: River Rocks 2.1 - 2.4
- FOSS Investigations: Using Rocks 3.1 - 3.5
- FOSS Investigations: Soil and Water 4.1 – 4.4

6-8 weeks

Teacher Resources

Teacher Note

- Foss Teacher's Manual
- Foss Teacher's Prep Videos
- Technology Tools -Google Classroom
 - Seesaw
 - BrainPOP
 - FlipGrid
 - Kahoot

**Differentiating Instruction:
Students with Disabilities, English Language Learners,
and Gifted & Talented Students**

Examples of Strategies and Practices that Support Students with Disabilities:

- Use of visual and multisensory formats
- Use of assisted technology
- Use of prompts
- Modification of content and student products
- Testing accommodations
- Authentic assessments

Examples of Strategies and Practices that Support Gifted & Talented Students:

- Adjusting the pace of lessons
- Curriculum compacting
- Inquiry-based instruction
- Independent study
- Higher-order thinking skills
- Interest-based content
- Student-driven instruction
- Real-world problems and scenarios

Examples of Strategies and Practices that Support English Language Learners:

- Pre-teaching of vocabulary and concepts
- Visual learning, including graphic organizers
- Use of cognates to increase comprehension
- Teacher modeling
- Pairing students with beginning English language skills with students who have more advanced English language skills
- Scaffolding
- Word walls
- Sentence frames
- Think-pair-share
- Cooperative learning groups

Science Grade 2 Life Science Unit

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| Unit Title: Plants and Animals | |
| Unit Summary: Students will observe the structures of plants and discover ways to propagate new plants from mature plants (from seeds, bulbs, roots, and stem cuttings). They will observe and describe changes that occur as plants grow. They will understand how habitat systems provide for the needs of both plants and animals. They will explore variation in the same kind of organism, including variation between young and adults. They will learn about the behavior of animals and their young and how these behaviors help the young survive. | |
| Primary Interdisciplinary Connections: ELA/Literacy W.2.7, W.2.8; Mathematics MP.2, MP.4, 2.MD.D.10 | |
| Career Readiness, Life Literacies, and Key Skills: 9.1.2.CR.1-2; 9.1.2. FI.1; 9.1.2.FP.13; 9.1.2.PB.1-2; 9.1.2.RM.1; 9.1.2.CAP.1-4; 9.4.2.CI.1-2; 9.4.2.CT.1-3; 9.4.2.DC.1-7; 9.4.2.GCA:1; 9.4.2.IML.1-4; 9.4.2.TL.1-7 | |
| Learning Targets | |
| NJSLS Standards: 2-LS4-1, K-2-ETS1-1, K-2-ETS1-2, K-2-ETS1-3 | |
| Computer Science and Design Thinking Standards: 8.1.2.CS.1-3; 8.1.5.NI.1-4; 8.1.2.IC.1; 8.1.2.DA.1-4; 8.1.2.AP.1-6; 8.2.2.ED.1-4; 8.2.2.ITH.1-5; 8.2.2.NT.1-2; 8.2.2.ETW.1-4; 8.2.2.EC.1 | |
| Climate Change Standards: | |
| <ul style="list-style-type: none"> • Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1) • Engaging in argument from evidence in K-2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s) by constructing an argument with evidence to support a claim (2-PS1-4) | |
| Content Statements: | |
| 1 | LS4.D: Biodiversity and Humans |
| Big Idea: Plants and animals need certain things to grow and change. A habitat is a place where plants and animals live. It provides what a plant or animal needs to survive. Young plants and animals resemble their parents. | |
| Unit Essential Questions: | Unit Enduring Understandings: |
| <ul style="list-style-type: none"> • What do seeds need? • How can we make a new plant from an old one? • What do plants and animals need to grow? • How do plants and animals survive in their habitat? | <p>Seeds are alive and need water to grow into new plants. Not all plants grow alike.</p> <ul style="list-style-type: none"> • New plants can grow from the stems of mature plants. • In order to grow, plants need water, nutrients, air, space, and light; animals need water, food, |

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| <ul style="list-style-type: none"> • What part of the plant can grow new plants? • What do animal parents do to help their young survive? | <p>air, and space with shelter.</p> <ul style="list-style-type: none"> • Plants and animals live in different environments and have structures and behaviors that help them survive. • Some parts of roots can grow into new plants. Other parts will not. • In many kinds of animals, parents and the offspring engage in behaviors that help the offspring survive. |
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Unit Learning Targets

Students will...

- Seeds need water to grow into new plants.
- Not all plants grow alike.
- Plant roots take in water and nutrients, and leaves make food from sunlight.
- Seeds are alive and grow into new plants.
- Plants have different structures that function in growth and survival.
- Individuals of the same kind (of plant or animal) look similar but also vary in many ways
- Leaves, twigs, and roots develop on stems at nodes.
- Potatoes are underground stems; potato eyes are nodes where buds grow.
- New plants can grow from the stems of mature plants.
- Plants are living organisms that need, water, air, nutrients, light, and space to grow.
- Plants need water, nutrients, air, space, and light; animals need water, food, air, and space with shelter.
- A habitat is a place where plants and animals live. It provides what a plant or animal needs to live.
- Plants and animals live in different environments and have structures and behaviors that help them survive. Animals use sensory structures to take in information about their surroundings and act on it.
 - Engineers learn from nature to solve problems. Plant bulbs are alive and grow new structures when provided with water.
- Some parts of roots will grow into new plants if they are provided with water. Other parts will not.
- Plants grow and change. Plants can produce new plants in many ways.
- Adult animals can have young (offspring), and the young resemble their parents.
- In many kinds of animals, parents and the offspring engage in behaviors that help the offspring survive

Evidence of Learning

Summative Assessment: FOSS Investigation I-checks (benchmark assessments)

Formative Assessments:

- Student’s Science notebooks
- Foss Labs

| Lesson Plans | |
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| <i>Activities/Interdisciplinary Connections</i> | <i>Timeframe</i> |
| <ul style="list-style-type: none"> • FOSS Investigations: Grass & Grain Seeds 1.1 – 1.4 • FOSS Investigations: Stems 2.1 – 2.3 • FOSS Investigations: Terrariums 3.1 – 3.4 • FOSS Investigations: Growth & Change 4.1 – 4.3 | 6 – 8 weeks |
| <i>Teacher Resources</i> | <i>Teacher Note</i> |
| <ul style="list-style-type: none"> • Foss Teacher’s Manual • Foss Teacher’s Prep Videos • Technology Tools -Google Classroom <ul style="list-style-type: none"> -Seesaw -BrainPOP -FlipGrid -Kahoot | |
| Differentiating Instruction: Students with Disabilities, English Language Learners, and Gifted & Talented Students | |
| <p>Examples of Strategies and Practices that Support Students with Disabilities:</p> <ul style="list-style-type: none"> • Use of visual and multisensory formats • Use of assisted technology • Use of prompts • Modification of content and student products • Testing accommodations • Authentic assessments <p>Examples of Strategies and Practices that Support Gifted & Talented Students:</p> <ul style="list-style-type: none"> • Adjusting the pace of lessons • Curriculum compacting • Inquiry-based instruction • Independent study • Higher-order thinking skills • Interest-based content • Student-driven instruction • Real-world problems and scenarios <p>Examples of Strategies and Practices that Support English Language Learners:</p> <ul style="list-style-type: none"> • Pre-teaching of vocabulary and concepts • Visual learning, including graphic organizers • Use of cognates to increase comprehension • Teacher modeling | |

- Pairing students with beginning English language skills with students who have more advanced English language skills
- Scaffolding
- Word walls
- Sentence frames
- Think-pair-share
- Cooperative learning groups

Science Grade 2 Physical Science Unit

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| Unit Title: Solids and Liquids | |
| Unit Summary: Students will observe, describe, and compare properties of solids and liquids. They will discover what happens when solids and water are mixed and when liquids and water are mixed. They will gain an understanding of changes caused by heating and cooling. | |
| Primary Interdisciplinary Connections: ELA/Literacy: RI.2.1, RI.2.3, RI.2.8, W.2.1, W.2.7, W.2.8. Mathematics: MP.2, MP.4, MP.5, 2.MD.D.10 | |
| Career Readiness, Life Literacies, and Key Skills: 9.1.2.CR.1-2; 9.1.2. FI.1; 9.1.2.FP.13; 9.1.2.PB.1-2; 9.1.2.RM.1; 9.1.2.CAP.1-4; 9.4.2.CI.1-2; 9.4 | |
| Learning Targets | |
| NJSLS Standards: 2-LS4-1, K-2-ETS1-1, K-2-ETS1-2, K-2-ETS1-3 | |
| Computer Science and Design Thinking Standards: 8.1.2.CS.1-3; 8.1.5.NI.1-4; 8.1.2.IC.1; 8.1.2.DA.1-4; 8.1.2.AP.1-6; 8.2.2.ED.1-4; 8.2.2.ITH.1-5; 8.2.2.NT.1-2; 8.2.2.ETW.1-4; 8.2.2.EC.1 | |
| Climate Change Standards: | |
| <ul style="list-style-type: none"> • Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1) • Engaging in argument from evidence in K-2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s) by constructing an argument with evidence to support a claim (2-PS1-4) | |
| Content Statements: | |
| 1 | PS1.A: Structure and Properties of Matter |
| 2 | PS1.B: Chemical Reactions |
| Big Idea: Students will develop an understanding about how materials are similar and different from one another and how the properties of materials relate to their use. | |
| Unit Essential Questions: | Unit Enduring Understandings: |
| <ul style="list-style-type: none"> • How can solids be described? • How can liquids be described? • How can you determine if a material is a solid or liquid? • What happens when solids and liquids are mixed with water? • How do properties of materials change | <ul style="list-style-type: none"> • Solids are a phase or state of matter identified by particular properties. • Liquids move and flow freely, take the shape of their containers and can be poured. • Solid material can occur as masses of small particles. • Some solids change and some dissolve when |

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| when they are heated or cooled? | mixed with water. <ul style="list-style-type: none"> • Some liquids mix with water, others form layers. • Heat causes materials to melt, cold causes them to freeze. |
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Unit Learning Targets

Students will...

- Solid is one state or phase of matter.
- Objects are described and identified by their properties.
- Objects are made of one or more materials.
- Natural and human-made objects occur outdoors.
- Liquid is one common state of matter.
- Liquids move freely in containers.
- Liquids have many properties that help identify them.
- Liquids take the shape of their containers.
- The surfaces of liquids are flat and level.
- Liquids pour and flow.
- Solid materials can occur as masses of small particles.
- A mass of particulate matter can form piles and support a denser object on its surface.
- Particulate solids can be separated by size (with screens).
- Masses of particulate matter can pour.
- The surface of a mass of particles is not flat and level.
- Particulate matter occurs naturally in the outdoors.
- Some solids change when mixed with water.
- Some solids dissolve in water.
- Water can be separated from a mixture through evaporation; evaporation leaves the solid behind.
- Some liquids mix with water; others form layers.
- Some materials have properties of both solids and liquids.
- Melting is the change from solid to liquid.
- Freezing is the change from liquid to solid.
- Heat causes materials to melt; cold causes them to freeze; changes can be reversible or irreversible.

Evidence of Learning

Summative Assessment: Foss Kit Investigation I-Checks (benchmark assessments)

Formative Assessments:

- Student’s Science notebooks
- Foss labs

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| Lesson Plans | |
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| <i>Activities/Interdisciplinary Connections</i> | <i>Timeframe</i> |
| <ul style="list-style-type: none"> • FOSS Investigations: Solids 1.1-1.5 • FOSS Investigations: Liquids 2.1-2.4 • FOSS Investigations: Bits & Pieces 3.1- 3.5 • FOSS Investigations: Solids, Liquids & Water 4.1-4.5 | 6-8 weeks |
| <i>Teacher Resources</i> | <i>Teacher Note</i> |
| <ul style="list-style-type: none"> • Foss Teacher’s Manual • Foss Teacher’s Prep Videos • Technology Tools -Google Classroom <ul style="list-style-type: none"> -Seesaw -BrainPOP -FlipGrid -Kahoot | |
| Differentiating Instruction: Students with Disabilities, English Language Learners, and Gifted & Talented Students | |
| <p>Examples of Strategies and Practices that Support Students with Disabilities:</p> <ul style="list-style-type: none"> • Use of visual and multisensory formats • Use of assisted technology • Use of prompts • Modification of content and student products • Testing accommodations • Authentic assessments <p>Examples of Strategies and Practices that Support Gifted & Talented Students:</p> <ul style="list-style-type: none"> • Adjusting the pace of lessons • Curriculum compacting • Inquiry-based instruction • Independent study • Higher-order thinking skills • Interest-based content • Student-driven instruction • Real-world problems and scenarios <p>Examples of Strategies and Practices that Support English Language Learners:</p> <ul style="list-style-type: none"> • Pre-teaching of vocabulary and concepts • Visual learning, including graphic organizers • Use of cognates to increase comprehension • Teacher modeling • Pairing students with beginning English language skills with students who have more advanced | |

English language skills

- Scaffolding
- Word walls
- Sentence frames
- Think-pair-share
- Cooperative learning groups