Brick LAB

TEACHING RESOURCE

SCIENCE • TECHNOLOGY • SOCIAL STUDIES • LANGUAGE ARTS

STEM CONNECTIONS & Earth Activity Cards

SAMPLE - Environmental engineers work to ensure that the earth is in good condition for future generations. For example, engineers are working on ways to create bleach that whitens recycled newsprint enough for office use, yet won't harm the environment. Recycling a four-foot stack of newspapers saves approximately the equivalent of one 40-foot fir tree. Challenge your learners to calculate the number of trees that would be saved if they recycled a stack of newspapers for each person's height in the room.

THEME: Trees
Earth Activity Card #1

This resource page is an example of how STEM applies to each Earth Activity Card. Feel free to use the cards to meet your needs and your imagination. Have fun!
Builds included on this card: Apple Tree, 3d Tree, 3d Pine Tree, Fall Leaves

Science

LIFE SCIENCE (K-4)

The Characteristics of Organisms

Organisms have basic needs. For example, animals need air, water, and food; plants require air, water, nutrients, and light. Organisms can survive only in environments in which their needs can be met. The world has many different environments, and distinct environments support the life of different types of organisms.

Math

GEOMETRY (PreK-2)

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships. Recognize, name, build, draw, compare, and sort two- and three-dimensional shapes.

Social Studies

PEOPLE, PLACES, AND ENVIRONMENT

Examine the interaction of human beings and their physical environment, the use of land, building of cities, and ecosystem changes in selected locales and regions.

Language Arts

COMMUNICATION SKILLS

Learners adjust their use of spoken, written, and visual language (e.g., conventions, style, vocabulary) to communicate effectively with a variety of audiences and for different purposes.

STEM Activity:

Environmental engineers work to ensure that the earth is in good condition for future generations. For example, engineers are working on ways to create bleach that whitens recycled newsprint enough for office use, yet won't harm the environment. Recycling a four-foot stack of newspapers saves approximately the equivalent of one 40-foot fir tree. **Challenge your learners to calculate the number of trees that would be saved if they recycled a stack of newspapers for each person's height in the room.**

THEME: Flowers
Earth Activity Card #2

This resource page is an example of how STEM applies to each Earth Activity Card. Feel free to use the cards to meet your needs and your imagination. Have fun!
Builds included on this card: 3D Daffodil, 3D Hyacinth, 3D Red Flower, Planter Box with Flowers.

Science

LIFE SCIENCE (K-4)

Organisms and their environments

All animals depend on plants. Some animals eat plants for food. Other animals eat animals that eat the plants.

Math

GEOMETRY STANDARD (3-5)

Apply transformations and use symmetry to analyze mathematical situations. Identify and describe line and rotational symmetry in two- and three-dimensional shapes and designs.

Social Studies

CULTURE (EARLY GRADES)

Describe ways in which language, stories, folktales, music, and artistic creations serve as expressions of culture and influence behavior of people living in a particular culture.

Language Arts

Learners conduct research on issues and interests by generating ideas and questions and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and non-print texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.

STEM Activity:

A flower's rotational symmetry is determined by how much it is rotated so that its image appears unchanged. The number of times an image looks the same during a 360 degree rotation determines the number of "folds." For example, if the flower is rotated 180 degrees and appears the same, it would have two-fold symmetry. As a formula, this looks like 360/n=folds, ie. 360/180=2. **Ask learners to engineer a new type of flower from one of the models on the card and determine the rotational symmetry to share with their peers.** Discuss how to increase or decrease the rotational symmetry of the model.

THEME: Famous Presidents
Earth Activity Card #3

This resource page is an example of how STEM applies to each Earth Activity Card. Feel free to use the cards to meet your needs and your imagination. Have fun!
Builds included on this card: Butterfly, Ant, Bumble Bee, Ladybug.

Science

LIFE SCIENCE (K-4)

Organisms and their environments

All organisms cause changes in the environment where they live. Some of these changes are detrimental to the organism or other organisms, whereas others are beneficial.

Math

MEASUREMENT (3-5)

Understand and apply basic concepts of probability. Describe events as likely or unlikely and discuss the degree of likelihood using such words as certain, equally likely, and impossible.

Social Studies

PEOPLE, PLACES & ENVIRONMENT (MIDDLE GRADES)

Examine, interpret, and analyze physical and cultural patterns and their interactions, such as land use, settlement patterns, cultural transmission of customs and ideas and ecosystem changes.

Language Arts

Learners use a variety of technological and information resources (e.g. libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.

STEM Activity:

Engineering is sometimes referred to as the "invisible" profession. Almost everything around you has been engineered in some way. Observing nature is a way engineers get ideas for new technology. Konstantin Kornev of Clemson University was awarded a National Science Foundation grant to develop artificial probes made of nanofibers. Nanofibers are fibers that are the size of one billionth of a meter. The probes were inspired by a butterfly's proboscis and used to draw out the viscous liquids inside cells and examine their contents. **Challenge learners to investigate and research physical characteristics of ants, butterflies, bees, and ladybugs from which humans could possibly benefit.**

THEME: Food
Earth Activity Card #4

The teacher resource page is an example of how STEM applies to each Earth Activity Card. Feel free to use the cards to meet your needs and your imagination. Have fun!

Builds included on this card: Pear, Strawberry, Apple, Banana

Science

LIFE SCIENCE (K-4)

Organisms and their environments

An organism's patterns of behavior are related to the nature of that organism's environment, including the kinds and numbers of other organisms present, the availability of food and resources, and the physical characteristics of the environ-ment. When the environment changes, some plants and animals survive and reproduce, and others die or move to new locations.

Math

NUMBERS & OPERATIONS (PreK-2)

Understands numbers, ways of representing numbers, relationships among numbers and number systems. Connect number words and numerals to the quantities they represent, using various physical models and representations.

Social Studies

PRODUCTION, DISTRIBUTION, & CONSUMPTION (EARLY GRADES)

Describe the relationship of price to supply and demand.

Language Arts

Learners employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.

STEM Activity:

There are many different types of engineering professions. Ask learners to research various types and list what they do. At home, take a look at the food items in your fridge or pantry. In the classroom, display some packaged or canned food items. **Challenge Learners to pick one of the food items and list the various engineering professions that would be involved in getting that food from the farm to the stores.**

THEME: Animals & Habitat
Earth Activity Card #5

This resource page is an example of how STEM applies to each Earth Activity Card. Feel free to use the cards to meet your needs and your imagination. Have fun!
Builds included on this card: Panda, Dolphin, Sea Turtle, Globe

Science

SCIENCE IN PERSONAL & SOCIAL PERSPECTIVES (K-4)

Changes in environments

Changes in environments can be natural or influenced by humans. Some changes are good, some are bad, and some are neither good nor bad. Pollution is a change in the environment that can influence the health, survival, or activities of organisms, including humans.

Math

ALGEBRA (3-5)

Use mathematical models to represent and understand quantitative relationships. Model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions.

Social Studies

GLOBAL CONNECTIONS (EARLY GRADES)

Explore causes, consequences, and possible solutions to persistent, contemporary, and emerging global issues, such as pollution and endangered species.

Language Arts

Learners apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound-letter correspondence, sentence structure, context, graphics).

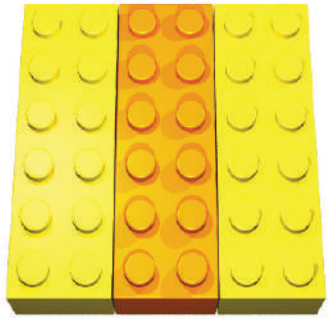
STEM Activity:

Learners pick an endangered animal from their region to research facts about habitat and environmental factors that are contributing to their population depletion. **Each learner or small group will design and build a protected sanctuary for their chosen animal and share it.**

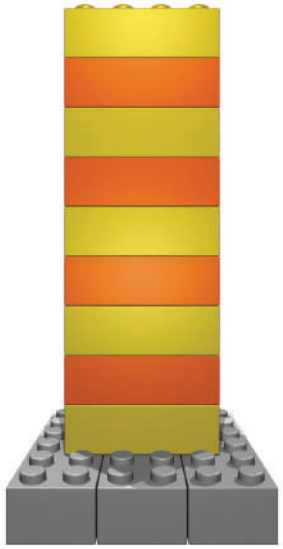
Optional: Equally divide the BrickLAB bricks per learner. Groups will need to recruit more people if their sanctuary is for a larger animal and more bricks are needed to provide an appropriate environment.

Earth Activity Card #1
Apple Tree

1

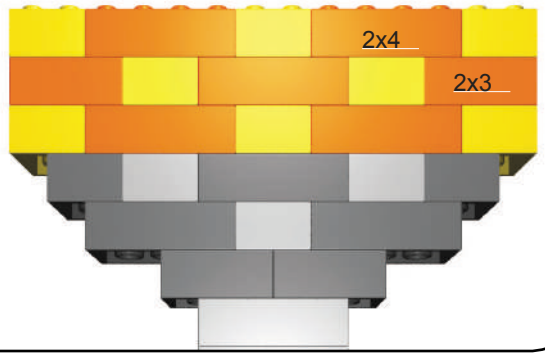


2

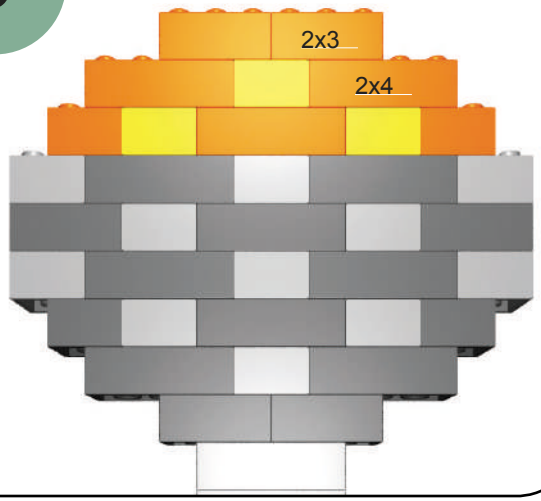


3

4

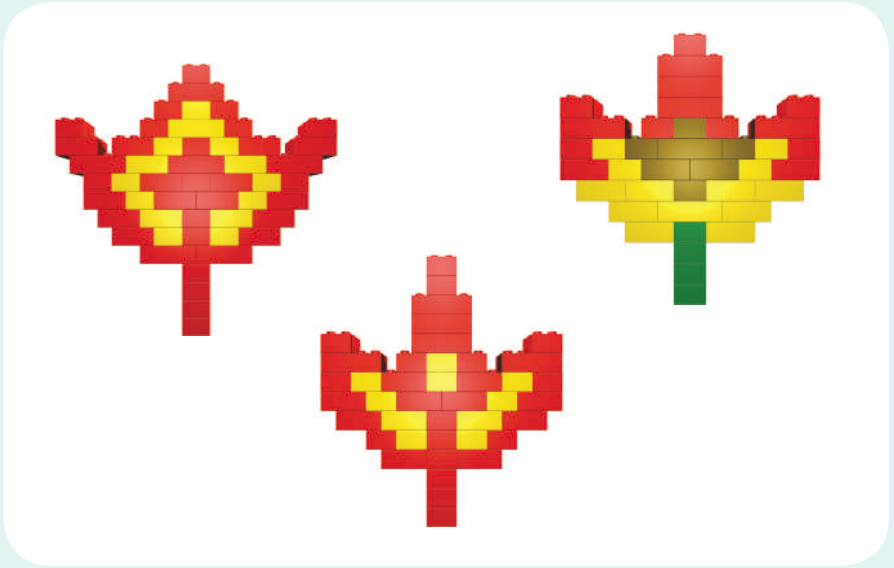


5



sales@edventures.com

3D Pine Tree



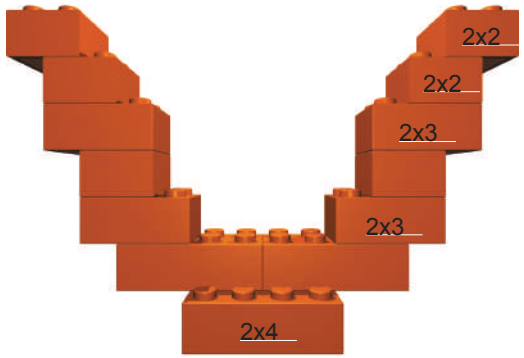
Leaves

3D Tree

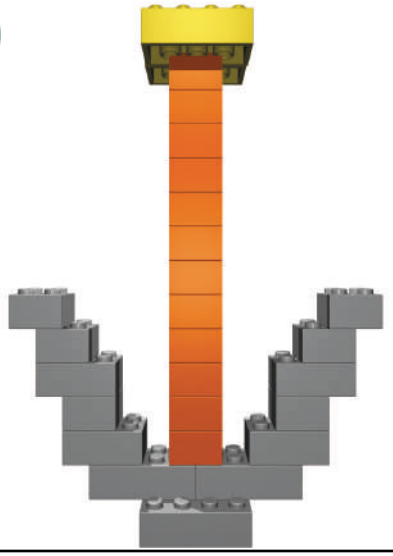
Theme: Trees

Earth Activity Card #2
Daffodil

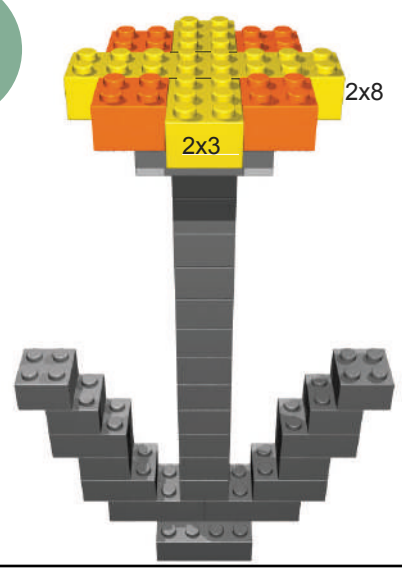
1



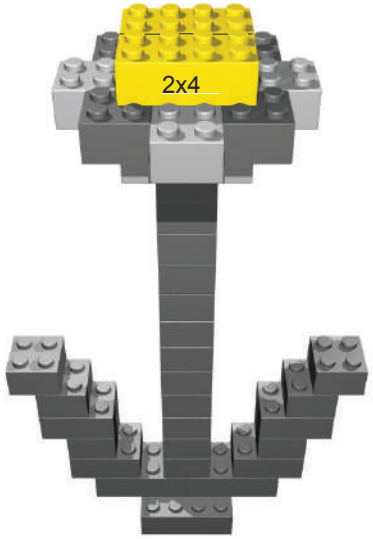
2



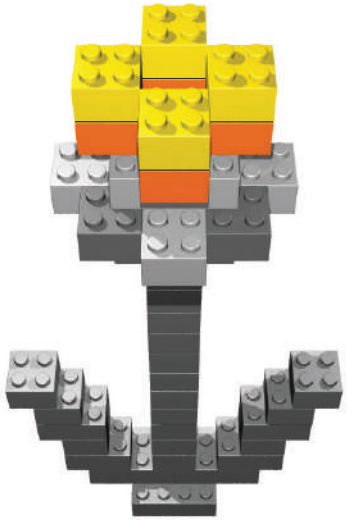
3

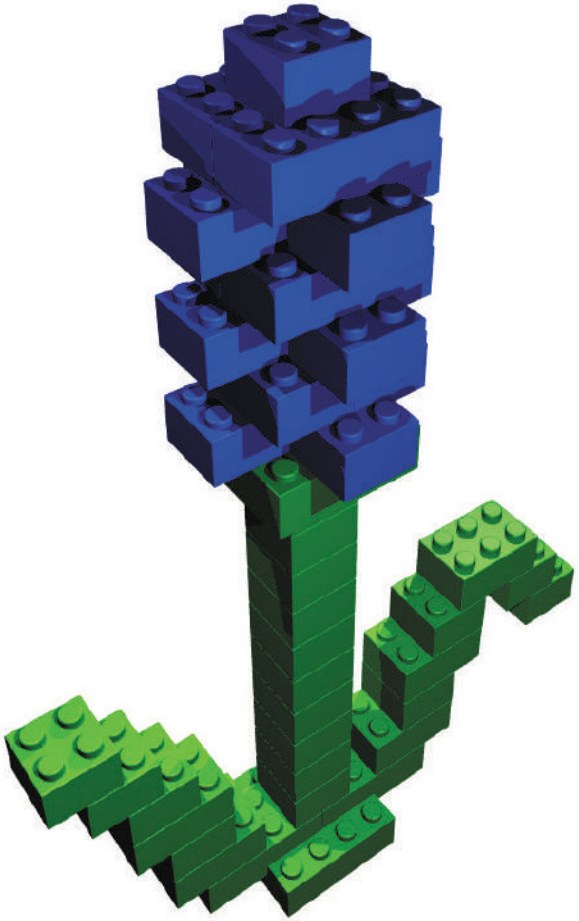


4

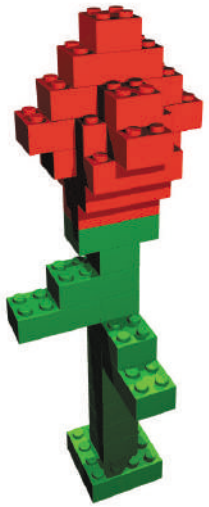


5

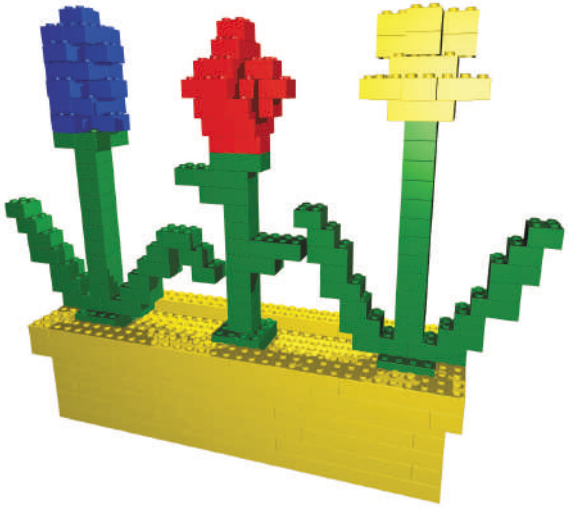




Hyacinth



Tulip



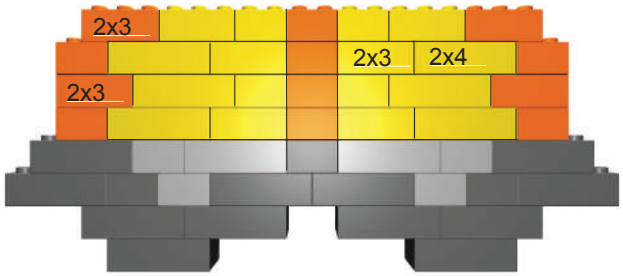
Window Box

Theme: Flowers

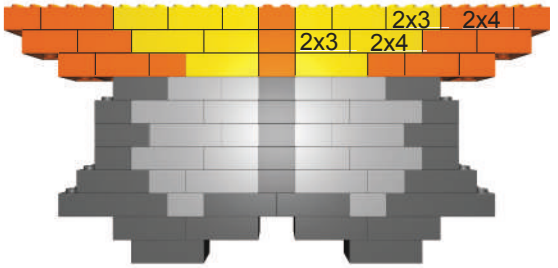
Earth Activity Card #3
Butterfly

1

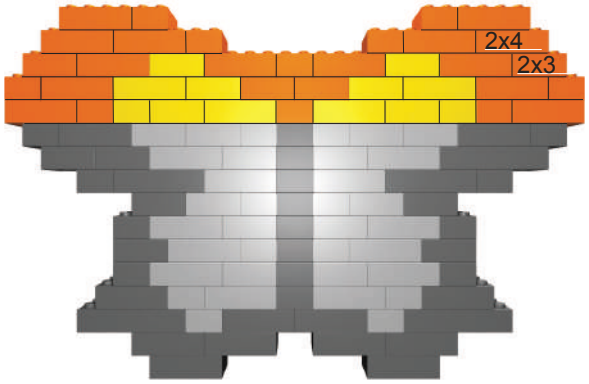
2



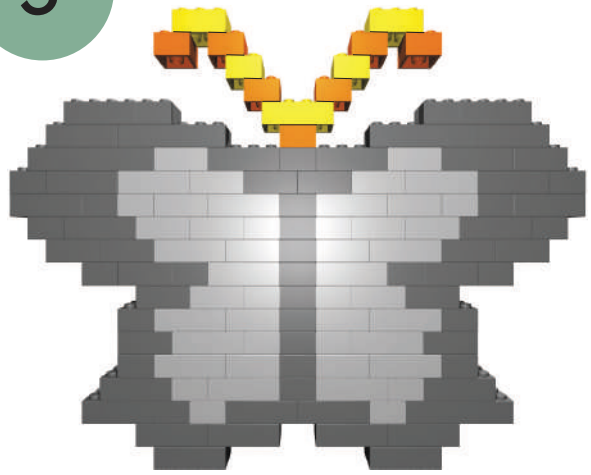
3

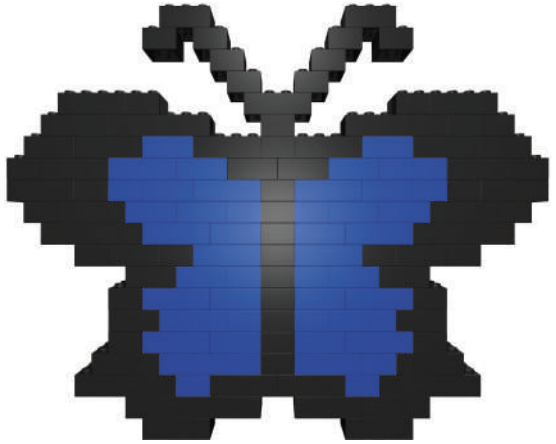


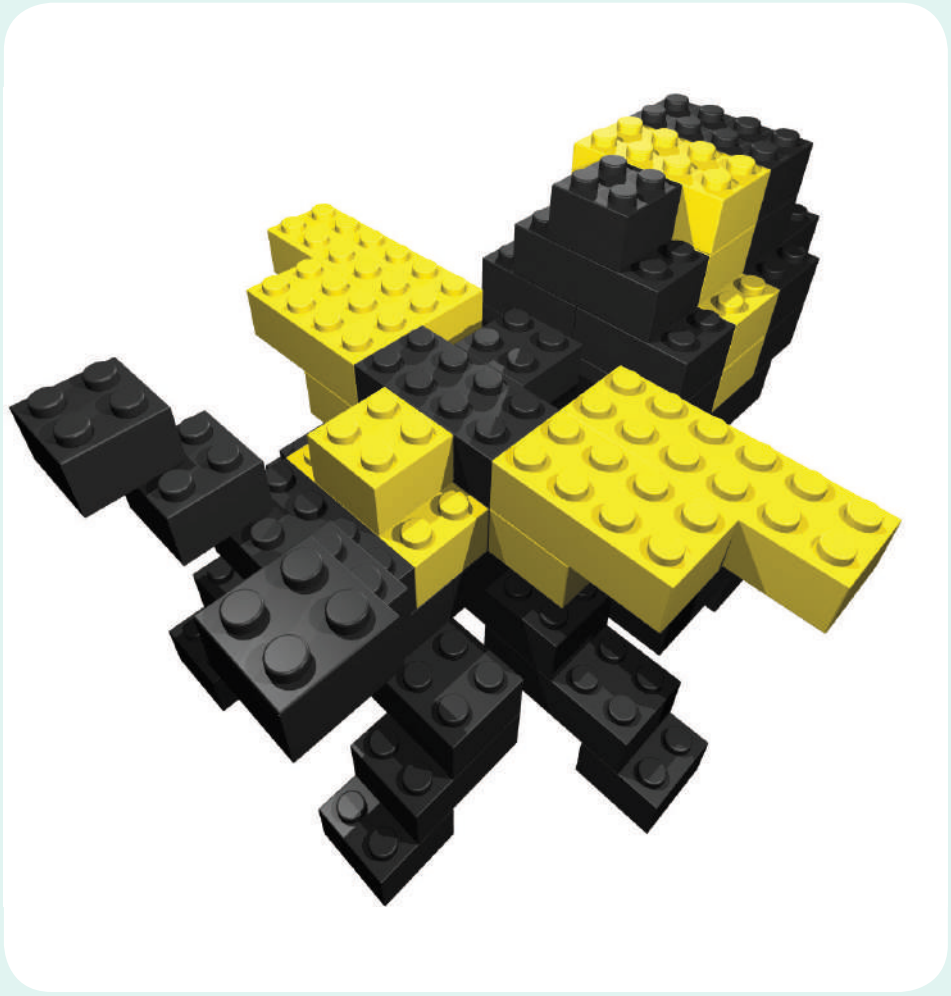
4



5

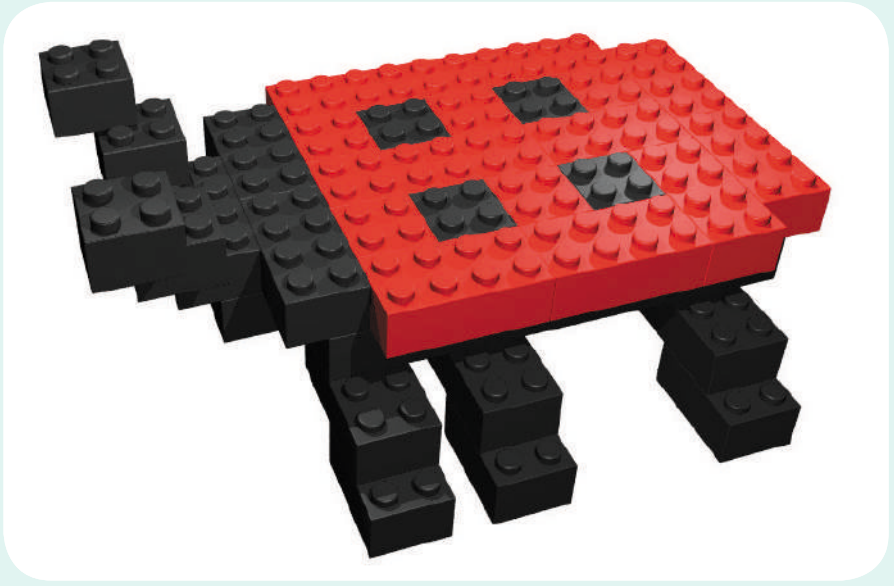






Bee

Red Ant

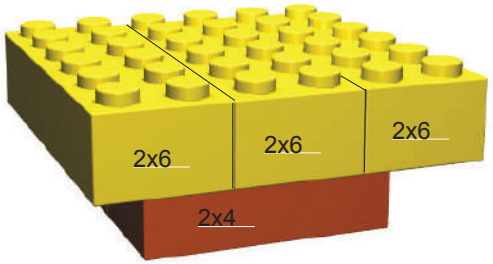


Ladybug

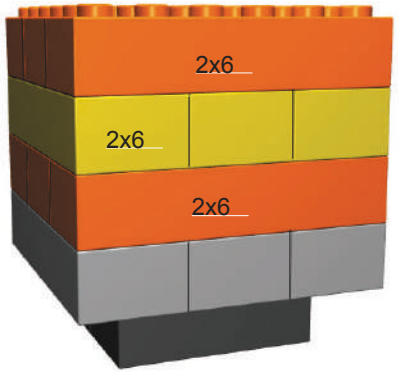
Theme: Insects

Earth Activity Card #4
Small Pear

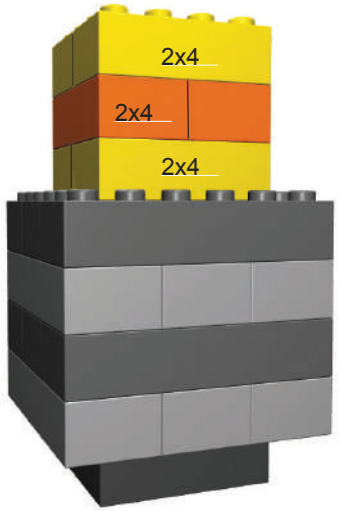
1



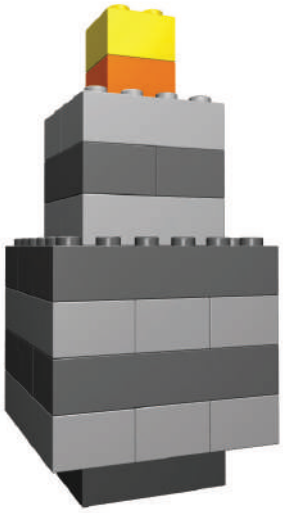
2



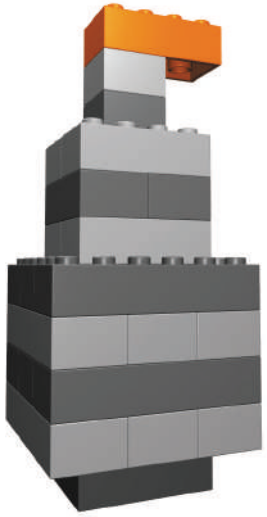
3

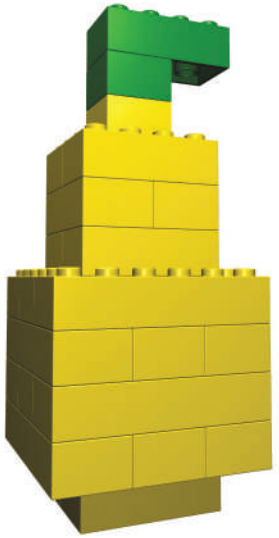


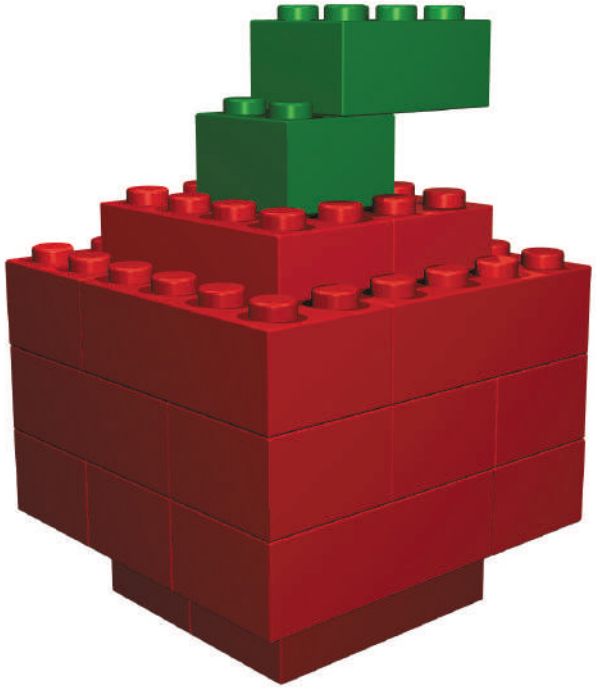
4



5

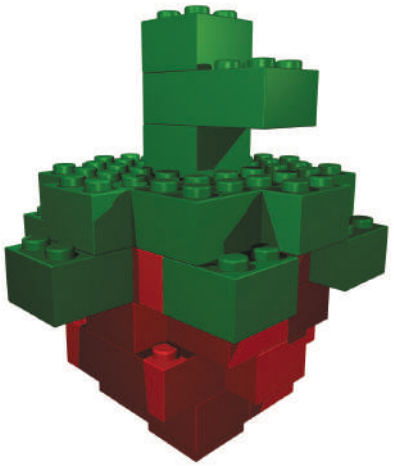






Apple

Theme: Food

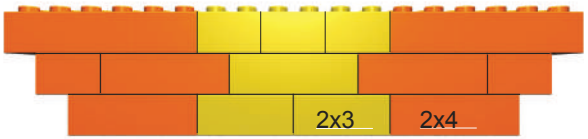


Strawberry

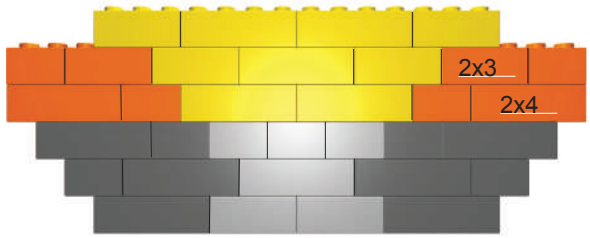
Banana

Earth Activity Card #5
Panda

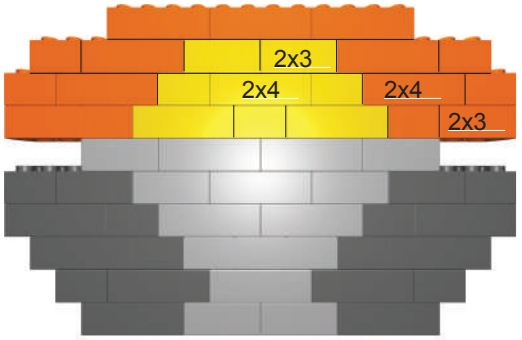
1



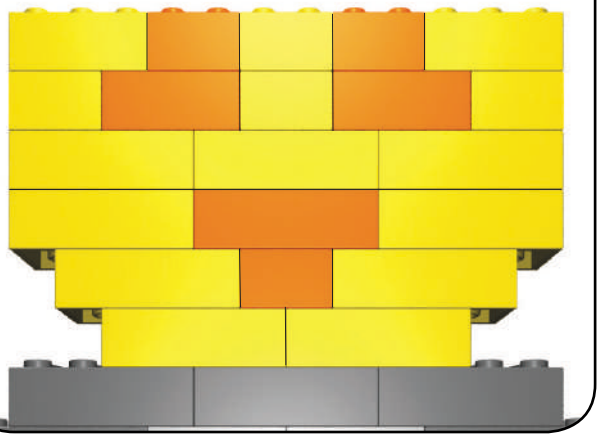
2



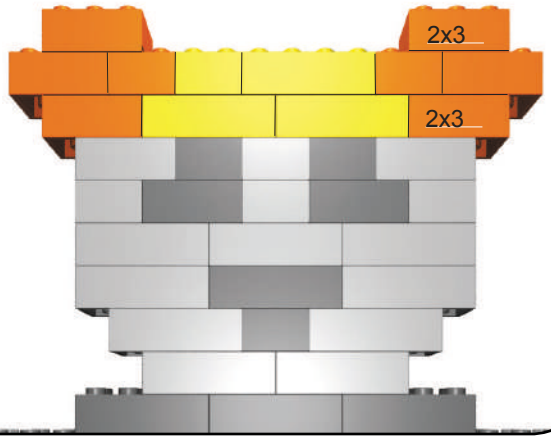
3

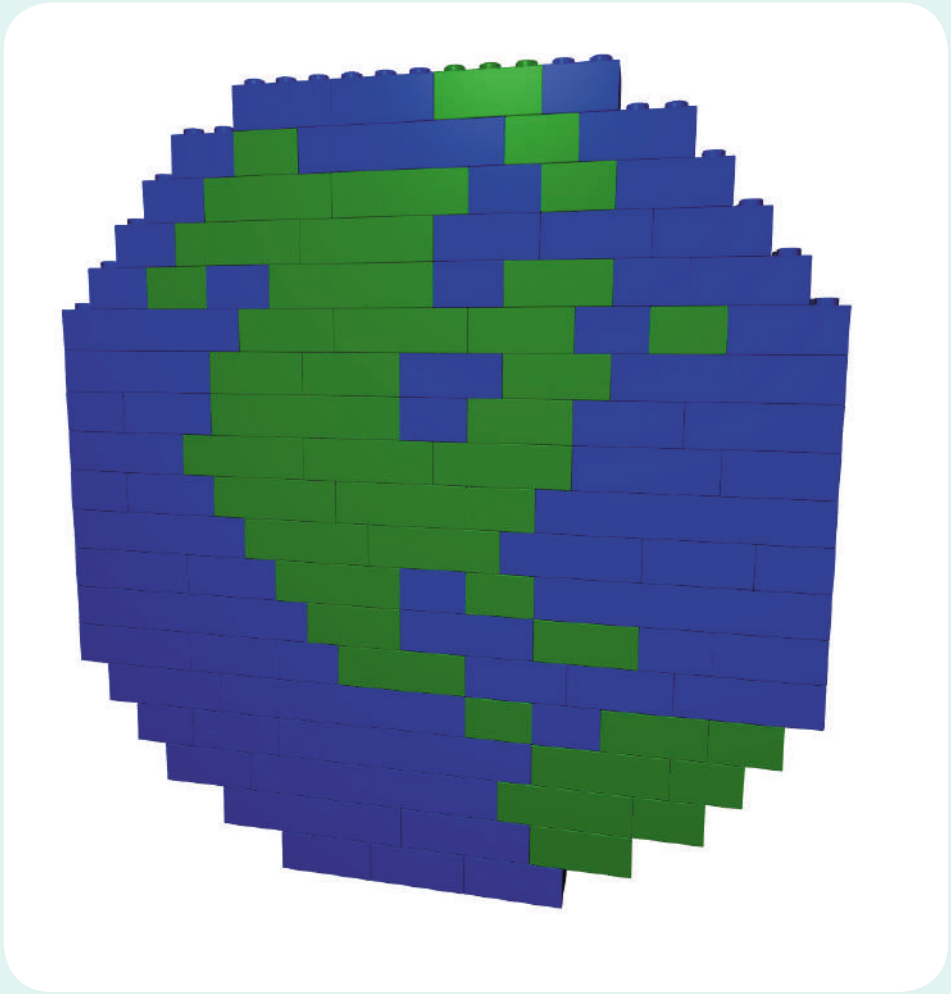


4

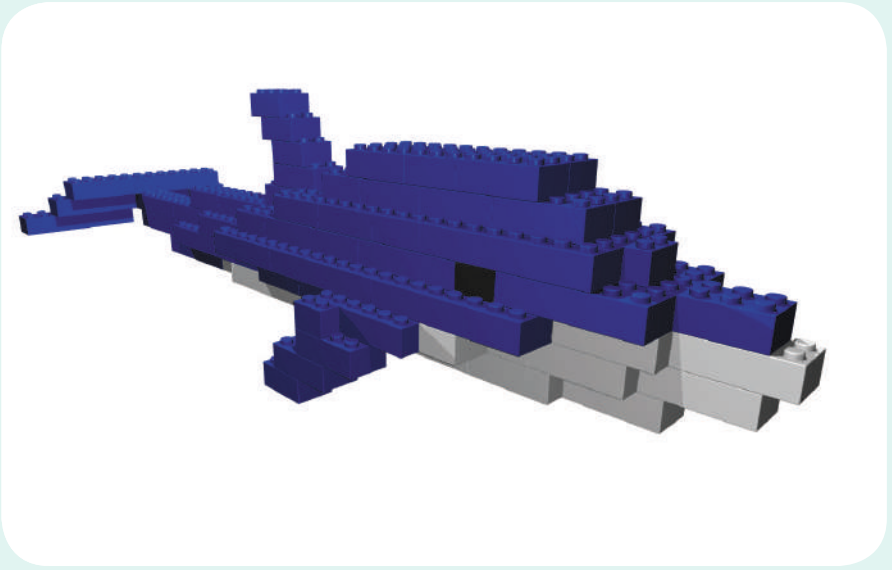


5

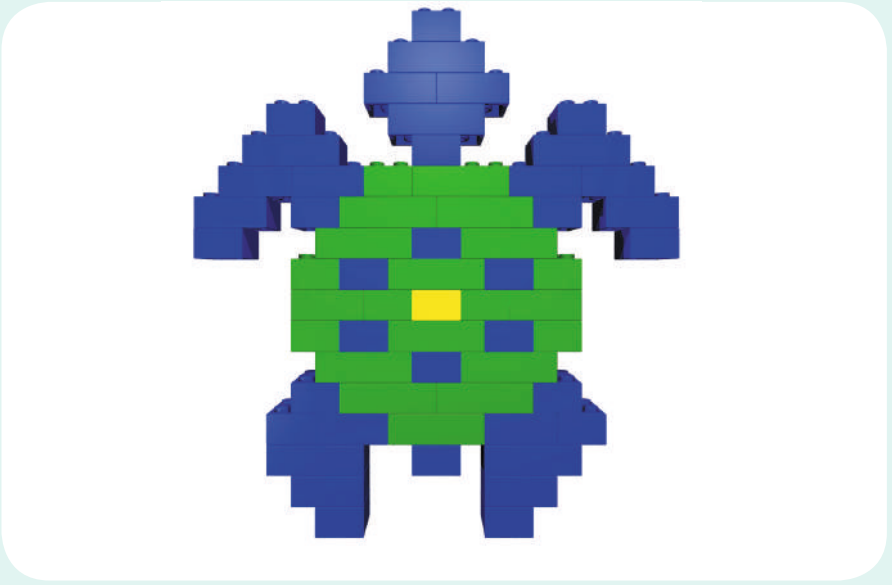




Earth



Dolphin



Sea Turtle

Theme: Animals & Habitat