

SCOPE AND SEQUENCE

2015-2016

Overview

zSpace curriculum supports learning for students in grades two through twelve. This document organizes the subject area of study by topic and within each topic, a suggested activity sequence is provided. As always, teachers are able adapt or create activities to meet the needs of their students.

Specific standards alignment for each activity can be found on our website: edu.zspace.com/activities

For questions about our curriculum, please contact us at: profdev@zspace.com

* Indicates that this activity appears in another location within the document and can be incorporated into more than one area of study.

Legend

ES Elementary School (grades K-5)

MS Middle School (grades 6-8)

HS High School (grades 9 -12)



Franklin's Lab



Newton's Park



Studio



Corinth












Cyber Science 3D






Leopoly

Physical Science






Electrical Current

Investigation - Conductivity	ES	
Conductivity Check	ES	
Investigation - Open and Closed	ES	
Challenge - Open and Closed	ES	
Investigation - Short Circuit	ES	
Challenge - Short Circuit	ES	
Investigation - Series vs. Parallel Circuit	ES	
Challenge - Series vs. Parallel Circuit	ES	
Heat and Cool Your School	ES	
Investigation - Resisting the Flow	ES	
Challenge - Resisting the Flow	ES	
Prefix Notation	HS	
String of Lights	HS	
Maximizing and Minimizing Resistance	HS	
Period and Frequency	HS	
Get That Current!	HS	
AND OR Circuits	HS	
LEDs and Photons	HS	
















Troubleshooting - Circuits

Troubleshooting Basics	ES	
Exploring zBot	ES	
Troubleshooting zBot	ES	

Troubleshooting - Circuits (cont.)








zBot Challenge	ES	
Quadcopter 1	ES MS	
Quadcopter 2	ES MS	
Quadcopter 3	ES MS	
Classic Riddle	HS	

Forces








Balanced and Unbalanced Forces	ES	
Sum of Forces Determines Motion Part 1	ES	
Unbalanced Forces Playground	ES	
Let's Bowl!	ES	
Discovering Friction Part 1	ES	
Discovering Friction Part 2	ES	
Ball to Cup 1	ES	
Ball to Cup 2	ES	
Ball to Cup 3	ES	
Graphing Force and Speed	ES	
Gravitational Force	ES MS	
Gravitational Force Evidence	ES MS	
Blast Off!	ES MS	
Sum of Forces Determines Motion Part 2	MS	
Force - Acceleration and Velocity	MS	

Physical Science








Forces (cont.)

Maze Master	MS	
Newton's Third Law of Motion	MS	
Design a Roller Coaster*	MS	
Putting Green Challenge	MS	
Motion Depends on Force and Mass	MS	
Gravity Investigation*	MS	
Dropping Objects on Other Planets	HS	








Energy

Patterns Predict Future Motion	ES	
Predicting the Future through Patterns	ES	
Kinetic Energy Transfer	MS	
Chain Reaction*	MS	
Energy Skee Ball	HS	
Shuffleboard	HS	
Basketball Dribble	HS	







Motion in a Straight Line

Graphing Force and Speed	ES	
Graphing Speed vs. Time Part 1*	MS	
Graphing Speed vs. Time Part 2*	MS	
Graphing Speed vs. Time - Gravity*	MS	
Graphing Speed vs. Time - Mass*	MS	
Speeding Ticket	HS	
Graphing Motion	HS	



Projectile Motion

Launched vs. Dropped	ES MS	
Parabolic Trajectories	ES MS	
Target Practice 1	ES MS	
Target Practice 2	ES MS	
Skate Park	ES MS	
Motorcycle Stunts	HS	
Pro Golfer	HS	



Momentum & Impulse

How Speed Relates to Energy and Momentum	ES	
How Collisions Affect Energy	ES	
Collision Course	ES	
Designing a Solution for Collisions	MS	
Lucky Shot	MS	
Accident Investigator	HS	

Chemistry




Bohr Models	MS	
Diamond & Graphite Molecular Structures	MS	

Structure and Function

Structure and Function - Transportation	Any	
Structure and Function - Engines	Any	

Engineering and Design

Scientific Method























Developing a Research Question & Hypothesis		
Define Your Variables		
Make Observations		
Is this a Good Experiment?		
Design & Build Your Experiment		
Present Your Data		
Scientific Method Challenge		

Problem-Based Learning



Plant a Wall*	MS	
Building a Solar Cooker*	MS	
Miniature Golf Tournament	MS	

Life Science









Anatomy - Human

Brain and the Spinal Cord	ES	
Human Eye and Sense of Sight	ES	
Through the Eye of a Camera	ES	
Human Ear and Sense of Hearing	ES	
Skin and Sense of Touch	ES	
Skeletal System	MS	
Fractures	MS	
Muscular System	MS	
Muscles in the Head	MS	
Circulatory and Respiratory Systems	MS	
Digestive System	MS	
Human Body Systems - Parasites	MS	
What is Your Blood Type?	MS	
Human Development - Embryo and Fetus	MS	
Nervous System	MS	
Brain and Nervous System	MS	
Neurons and Synapses	MS	
Human Eye and Eye Disorders	MS	
Human Ear and Ear Disorders	MS	
Human Anatomy - Circulatory System	HS	
Human Anatomy - Respiratory System	HS	
Human Anatomy - Digestive System	HS	







Anatomy - Human (cont.)

Human Anatomy - Nervous System	HS	
Human Anatomy - The Brain	HS	

Biochemistry

















Carbohydrates 1	HS	
Carbohydrates 2	HS	
Carbohydrates 3	HS	
Chemical Impacts - Human Response	HS	
Chemical Impacts - Ecological Interactions	HS	
Hormones and Neurotransmitters	HS	
Proteins	HS	
Lipids	HS	

Biomes & Habitats






Biome	ES	
Tundra Biome	ES	
Grassland Biome	ES	
Forest Biome	ES	
Desert Biome	ES	
Aquatic Biome	ES	
Surviving Your Habitat	ES	
Ecosystem Explorations	ES	

Life Science


Botany

Leaf Variations	ES	
Plant Life Cycle Part 1*	ES	
Plant Life Cycle Part 2	ES	
Flower Variations	ES	
Seed Dispersal	ES	
Dicot Flower Dissection	ES	
Cactus Structures	ES	
Plant Adaptations	ES	
Trees - Coniferous vs. Deciduous	ES	
Key Factors for Plant Growth	ES	
Pollinators	MS	
Plant Cell Structures*	MS	
Plant a Wall*	MS	
Angiosperm Coevolution	HS	
Botany - Flower Investigation	HS	
Botany - Parts of a Flower Assessment	HS	









Cells and Viruses

Unicellular vs. Multicellular Organisms	MS	
Animal Cell Structures	MS	
Plant Cell Structures*	MS	
Bacteria vs. Viruses	MS	
Structure and Function - Cell Walls	MS	








Cells and Viruses (cont.)

Junk Cell	MS	
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Classification

Classification of Animals	ES	
Kingdom Eubacteria	HS	
Kingdom Protista	HS	
Kingdom Fungi	HS	
Kingdom Plantae - Fern	HS	
Kingdom Plantae - Ginkgo	HS	
Kingdom Plantae - Ginkgo Leaf	HS	
Kingdom Plantae - Dicot Flower	HS	

Cycles




Water Cycle	ES	
Frog Life Cycle*	ES	
Butterfly Life Cycle*	ES	
Termite Life Cycle	ES	
Cycle of Matter	MS	
Carbon Cycle	MS	
Nitrogen Cycle	MS	

Evolution









Evolution of Sea Turtles	ES	
Fossil Clues	ES	
Fossil Exploration	ES	

Life Science

Evolution (cont.)

Paleontologist for a Day	ES	
Let's Be Dinosaur Detectives	ES	
Human Evolution	ES	
Peppered Moth	MS	
Mammoth and Elephant	MS	
Evolutionary Relationships	MS	
Food Processors	MS	
Comparative Anatomy	HS	
Discovering the Taung Child Skull	HS	
The Mystery of the Taung Child Skull	HS	









Genetics

Parent and Baby Animals*	ES	
Crossing Two Traits	HS	
Are You a Carrier?	HS	
Sickle Cell Anemia	HS	
Fruit Flies	HS	
Single Trait Crosses	HS	
Mendel's Pea Plants	HS	
Mendelian Inheritance and Exceptions	HS	



Human Impact

Human Impact on the Environment	ES	
Solution for an Environmental Problem	MS	

Relationships


Owl Pellet and Food Chain	ES	
Decomposers - Earthworms	ES	
Decomposers - Fungi and Bacteria	ES	
Predators and Prey	ES MS	
Food Chains in an Ecosystem	ES MS	
Energy Pyramid	MS	
Interactions in the Savannah	MS	
Symbiotic Relationships	MS	

Zoology





















Let's Be Entomologists	ES	
Termite Life Cycle	ES	
Butterfly Life Cycle*	ES	
Frogs and Toads	ES	
Frog Life Cycle*	ES	
Remarkable Reptiles	ES	
Bird Beaks and Feet	ES	
Mammals, Mammals, Everywhere	ES	
Parent and Baby Animals*	ES	
Animal Variations	ES	
Animal Tracks and Movement	ES	
Insect Characteristics	ES	
Fish Characteristics	ES	







Life Science

Zoology (cont.)

Fish Movement Through Water	ES	
Reptile Characteristics	ES	
Wings for Flight	ES	
Animal Defenses	ES	
Animal Teeth and Diet	ES	
What Happened Here?	ES	
Mammal Characteristics	ES	
Animal Structures and Functions	ES	
Structure and Function - Mammal Skulls	ES	
Frog Dissection	MS	



Earth and Space Science

Earth		
Layers of the Earth	ES	
Rock Cycle and Types of Rocks	ES	
Caves	ES	
Minerals and Gems	ES	
Volcanoes	ES	
Weathering	ES	
Layers of the Earth's Atmosphere	ES	
Earth's Ozone Layer	ES	
Soil, Weathering, and Erosion	ES MS	
Seasons	ES MS	
Plate Boundaries	MS	
How Does Living = Destruction	MS	
Solar System and Space		
Moon Exploration	ES	
NASA Space Exploration - Earth Orbit	ES	
Space Living and Research	ES	
Geocentric vs. Heliocentric Solar System	ES MS	
Games Around the Solar System	ES MS	
Gravity Investigation*	ES MS	
Our Solar System	MS	
Sun Exploration	MS	





Solar System and Space (cont.)		
Building a Solar Cooker*	MS	
Solar System Planet Exploration: Mars	MS	
Lunar and Solar Eclipse	MS	
Exploring Constellations	MS	
Renewable Resources		
Renewable vs. Nonrenewable Energy - Water Wheels	ES	
Renewable vs. Nonrenewable Energy - Solar Panels	ES	
Renewable vs. Nonrenewable Energy - Wind Turbines	ES	

Mathematics













Math Basics

Exploring Base 10 Blocks	ES	
Adding & Subtracting with Base 10 Blocks	ES	



Shapes

Identifying 2D Figures	ES	
Quadrilateral Hierarchy	ES	
3D Solids	ES	
Cube Nets	ES MS	












Volume and Surface Area

Investigate Cubes and Rectangular Prisms	ES MS	
Investigate Pyramids and Cylinders	ES MS	
Volume of Rectangular Prisms - Using Unit Cubes	ES MS	
Volume of Rectangular Prisms - Using Layers	ES MS	
Volume of Rectangular Prisms - Using the Standard Algorithm (Fractions and Decimals)	ES MS	
Volume of Composite Solids - Using Unit Cubes	ES MS	
Volume of Rectangular Prisms - Scaling the Unit Cubes	ES MS	
Volume of Rectangular Prisms with Holes	ES MS	
Surface Area of Rectangular Prisms - Using Unit Cubes	ES MS	
Volume and Surface Area of Rectangular Prisms	ES MS	
3D Figures: Surface Area and Volume	ES MS	
Volume and Surface Area of Prisms (Fractions and Decimals)	ES MS	

Volume and Surface Area (cont.)







Volume and Surface Area Scaling	ES MS	
Nets of Rectangular Prisms	ES MS	

Fractions





Finding Fractions Using Fraction Shapes	ES	
Modeling Fractions	ES	
Equivalent Fractions with Fraction Bars	ES	
Adding Fractions with Fraction Bars	ES	
Subtracting Fractions with Fraction Bars	ES	
Modeling Fractions - Multiplication	ES MS	
Modeling Multiplication of Whole Numbers and Fractions	ES MS	
Model Multiplying Decimals	ES MS	
Famous Structures - Ratio	ES MS	
Solar System Gravity and Force - Ratios	ES MS	
Fraction Amusement Park	ES MS	

Mathematics

Graphing







Graphing Force and Speed	ES	
Solar System Gravity Forces - Analyze Data on Line Graphs	ES MS	
Graphing Speed vs. Time Part 1*	MS	
Graphing Speed vs. Time Part 2*	MS	
Graphing Speed vs. Time - Gravity*	MS	
Graphing Speed vs. Time - Mass*	MS	

Graphing (cont.)








Slope Matters!	MS	
Design a Roller Coaster*	All	
Chain Reaction*	All	
Many more coming soon with Leopold 3D creation	All	

Social Sciences

Changes Over Time

Inventions - Archimedes Screw	ES	
Building to the Sky	ES	
History of Oil Lamps	Any	
Structure and Function - Prostheses	Any	
History of the Printing Press	Any	
Industrial Revolution - Inventions	Any	

History

Ancient Egypt	Any	
Ancient Greece and Rome	Any	
Ancient Calendars	Any	
Celtic Village	Any	
Medieval Castle	Any	
Medieval Weaponry	Any	
Pioneer Movement	Any	

Create and Model

Botany - Flower Investigation	High School
Bird Beaks and Feet	Elementary
Animal Teeth and Diet	Elementary
Wings for Flight	Elementary
Caves	Elementary
NASA Space Exploration - Earth Orbit	Elementary
History of Oil Lamps	Middle School
Structure and Function - Prostheses	Middle School
History of the Printing Press	Any
Ancient Greece and Rome	Elementary Middle School
Carbohydrates 1	High School
Carbohydrates 2	High School
Carbohydrates 3	High School
Hormones and Neurotransmitters	High School
Proteins	High School
Lipids	High School
Structure and Function - Mammal Skulls	Elementary

Finding Fractions Using the Fraction Shapes	Elementary
Famous Structures - Ratio	Elementary Middle School
Identify 2D Figures	Elementary
3D Solids	Elementary
Exploring Base 10 Blocks	Elementary
Dropping Objects on Other Planets	High School
Volume of Rectangular Prisms - Using the Standard Algorithm (Fractions and Decimals)	Elementary Middle School
Volume of Composite Solids - Using Unit Cubes	Elementary Middle School
Volume and Surface Area of Rectangular Prisms	Elementary Middle School
3D Figures: Volume and Surface Area	Elementary Middle School
Renewable vs. Nonrenewable Energy - Water Wheels	Elementary
Volcanoes	Elementary
Structure and Function - Engines	Any