AIR FAIR BIG IDEAS MATRIX

EXHIBIT COMPONENT	EXHIBIT EXPERIENCE	CLASSROOM CONNECTIONS		
		FOSS	**FOSS**	**SCIENCE TEKS (K – 3)**
		SCIENCE CONTENT	**THINKING PROCESSES**	
PROPERTIES OF AIR				
1. BERNOULLI BLOWER	Experiment with a ball that seems to float above an air nozzle. If the ball is pulled slowly out of the air stream, a force is felt trying to pull it back. Air at Work: pressure is lower in a moving air stream than in the more stationary air around it. Higher pressure surrounding the ball holds it in the stream.	Air is all around objects. Air interacts with objects.	Observe the properties of moving air as it interacts with objects and materials.	K.4A; K.7A 1.7A 2.7A 3.6A;
2. AIR TUBES	Observe how everyday objects behave in vertical air flow inside clear tubes. Make and test designs to vary weight, shape and surface area and explore resistance, turbulence and symmetry. Manipulate the push of moving air against the pull of gravity.	Moving air affects objects and materials. Air resistance affects how things move. Air takes up space.	Observe the properties of moving air as it interacts with objects and materials. Observe and compare the action of moving air and its effects on objects and materials.	K.2; K.7A 1.2; 1.7A 2.2; 2.7C 3.2A; 3.6A;
3. AIR CANNON	Aim and launch a surprisingly powerful puff air across the room by compressing it through a small hole. Feel the puff and observe it move disks several feet away. Measure the distance and compare the effects.	Air can be compressed into a smaller space. Pressure from compressed air can move things.	Observe the properties of air when it is put under pressure.	K.2; K.4A; K.7A 1.2; 1.7A 2.2; 2.4; 2.7C 3.2; 3.4A; 3.6A
4. AIR MAIL	Arrange word balls to make a short sentence then propel your message 100' through a tube of moving air.	Air interacts with objects. Moving air can create a push that moves objects.	Observe and compare the action of moving air and its effects on objects and materials.	K.7A, 1.7A, 2.7A
5. AIR TABLES	Manipulate air flow to observe its ability to roll, spin and inflate objects.	Air takes up space and interacts with objects. Air resistance affects how things move.	Observe the properties of moving air as it interacts with objects and materials. Observe and compare the action of moving air and its effects on objects and materials.	K.4A; K.7A 1.7A 2.7C 3.6A
6. SAILBOAT TABLES	Control fans to create air flow that pushes the sails of boats that glide on a layer of air. Compare the effectiveness of different sail shapes to resist airflow and push the boat.	Moving air can create a push force that moves objects. Air resistance affects how things move.	Observe and compare the action of moving air and its effects on objects and materials.	K.2; K.7A 1.2; 1.4; 1.7A 2.2; 2.4; 2.7C 3.2; 3.4; 3.6A
KID-POWERED AIR **7. Bellows**	Push down on the bellows to compress air that lifts a ball inside a tube.	Air takes up space and can be compressed into a smaller space. Pressure from compressed air can move things.	Observe the properties of air when it's put under pressure.	K.7A; 1.7A; 2.7C; 3.6A

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8. Squirrel cage fan	Turn a handle to spin fan blades inside a cylinder and create air flow that lifts a ball inside a tube. Compare the effort needed to lift the ball to heights marked on the tube.	Moving air can create a push that moves objects.	Observe and compare the action of moving air and its effects on objects and materials.	
9. Crank	Create air flow by turning a crank that spins a ceiling fan high above.	Moving air can create a push that moves objects.	Observe and compare the action of moving air and its effects on objects and materials.	
10. PNEUMATIC LAUNCHER	Lift and drop a bowling ball inside a tube to compress air into a smaller tube and launch a tennis ball toward a target. Observe and measure the flight path of the tennis ball.	Air takes up space and can be compressed into a smaller space. Pressure from compressed air can move things.	Observe the properties of air when it's put under pressure. Observe and compare the flight line of the tennis ball in relation to the force of the push of air.	K.2; K.7A 1.2; 1.7A 2.2; 2.4; 2.7A; 2.7C 3.2; 3.4; 3.6A
AIR and WEATHER				
11. TOUCHABLE TORNADO	Set a rising column of mist spinning with horizontal wind shear. Manipulate the shape and width of the vortex by varying the speed of the wind and by interrupting the flow with your hand.	Wind is moving air.	Observe the properties of moving air.	K.7A; 1.7A; 2.7A; 3.6
12. WIND CHAMBER	Step in to get a feel for the forces of wind at work. Capes, windsocks and objects amplify exploration of the push and pull of air. Compare how shapes of objects affect how they respond or resist airflow. Measure wind speed with an anemometer.	Wind is moving air. Air resistance affects how things move. Wind speed can be described using an anemometer.	Observe the properties of air as it interacts with other materials. Observe and compare the action of moving air and its effects on objects and materials. Observe and describe the speed of wind using an anemometer.	K.2; K.7A 1.2; 1.7A 2.2; 2.7A 3.2; 3.6A
AIR and SOUND				
13. TUBE TUNES	Plunk the end of a PVC tube to vibrate the tube which then vibrates the air molecules inside. Follow color and shape patterns to thump out tunes on 8 tubes of graduated length and pitch. Feel the tubes vibrate and observe the relationship of length to pitch.	Sound is caused by vibrations – it originates from a vibrating source/object. Sound travels through air. Pitch is how low or high a sound is. Differences in pitch are caused by differences in the rate at which an object vibrates. The length of a vibrating object is one variable that affects the pitch of the sound it makes.		K.5; 1.5; 2.5

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14. BIG EARS	Compared with some animals, human ears are small, close to our heads and immovable. What if you had sound catchers as big as an elephant's or shaped like a bat's? Listen and compare 2 giant sound catchers to find out what you may be missing.	Sound travels through air. A sound receiver detects sound vibrations. Our outer ears are designed to receive, focus and amplify sounds.	Observe that the outer ear is designed to receive sounds.	K.7A; 1.7A; 1.9A; 2.7A; 2.9A; 3.9A
15. SOUNDS ALL AROUND	Sound waves traveling through air arrive at your two outer ears from all directions. The hearing center in your brain depends on information from both ears to determine the direction of sounds around you. Try on different sets of headphones to see happens when sound direction information is scrambled.	A sound receiver detects sound vibrations. Our outer ears are designed to receive, focus and amplify sounds.	Observe that the outer ear is designed to receive sounds.	K.7A; 1.7A; 1.9A; 2.7A; 2.9A; 3.9A