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**Thinking Outside
the Box**



Thinking Outside the Box

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Goals

The goal of this project is to have students involved in higher order thinking concepts in a project-based learning style all while utilizing low-cost recycled materials that allow students to think outside the box. We want to teach our students the benefit of a sustainable lifestyle and teach them ways to use recycled materials in and outside the classroom. Our goal is to find ways to teach our students without having to buy expensive resources. We want parents to feel included in their child's learning and this project will give parents and students the opportunity to feel included by donating resources that are of no cost to them.

Objectives

Students will work together with a partner to solve real world problems

Students will interpret and analyze data to generate appropriate explanations.

Florida Standards

Pre-K FELDS

V. Mathematical Thinking

VF1: Measures object attributes using a variety of standard and nonstandard tools

VF2: Identifies measurable attributes such as length and weight and solves problems by making direct comparisons of objects

VD4 Constructs with three-dimensional shapes in the environment through play

VI.F.1.a: Identifies problems and tries to solve them by designing or using tools (e.g., makes a simple tent with a chair and cloth for protection from the sun)

VI.F.1.d: Invents and constructs simple objects or more complex structures and investigates concepts of motion and stability of structures (e.g., ramps, pathways, structure, Legos, block building and play)

VI. A. 3.a: Makes predictions and tests their predictions through experimentation and investigation

IV. Language and Literacy

IV.E.2.a: Asks and responds to more complex statements and questions, follows another's conversational lead, maintains multi-turn conversations, appropriately introduces new content and appropriately initiates or ends conversations

VI. Scientific Inquiry

VI.F.1.a: Identifies problems and tries to solve them by designing or using tools

III. Social and Emotional Development

III.C.2.b.: Maintains friendships and is able to engage in prosocial behavior such as cooperating, compromising and turn-taking

III.C.3.a Able to independently engage in simple social problem solving including offering potential solutions and reflecting on the appropriateness of the solution

VIII. Creative Expression Through the Arts

VII.E.1: Uses appropriate art vocabulary to describe own art creations and those of others

K-5th Standards

SC.K.N.13

Keep records as appropriate -- such as pictorial records -- of investigations conducted.

SC.K.N.14

Observe and create a visual representation of an object which includes its major features.

SC.K.N.11

Collaborate with a partner to collect information.

SC.K.E.5.1

Explore the Law of Gravity by investigating how objects are pulled toward the ground unless something holds them up.

MA.1.M.1.1

Estimate the length of an object to the nearest inch. Measure the length of an object to the nearest inch or centimeter.

ELA.2.C.1.1

Demonstrate legible printing skills.

SC.3.N.13

Keep records as appropriate, such as pictorial, written, or simple charts and graphs, of investigations conducted

MA.4.DP.1.3

Solve real-world problems involving numerical data.

MA.4.NSO.2.1

Recall multiplication facts with factors up to 12 and related division facts with automaticity.

Overview

This project will help teachers teach students how to use repurpose recycled materials. Students will use critical thinking skills to solve problems and build new structures all while learning academic topics. This project will help teachers spend less on teaching materials and use recyclables as teaching manipulatives that are free of cost. I will help all students feel included by giving them an opportunity to contribute to their class regardless of socio-economic status.

This project can easily be adapted to many other age groups as well as smaller and larger groups. The lesson plan included is for PreK students but can easily be adapted by adding more difficult and specific criteria. The benefit of this project is that every student at any level has a way to contribute whether it be artistically or academically. All students can have a sense of belonging.



Materials and Set Up

The materials needed to carry out this lesson are recycled materials such as cardboard boxes, plastic caps, and other optional materials such as paint, rulers, journals, pencils, pens, markers, individual whiteboards, construction hats, scissors, tape, cardstock, construction paper, box cutter, markers, paint sticks, glitter, glue

In the classroom there will be an area designated for recycled boxes. This area should be large enough for students to walk in and out comfortably to select their boxes and materials.

Students should have a clear desk or floor space to build their creations.



Lesson plan

Opener

The teacher will show the class a small box and then put the box on his/her head as say “look I have a new hat”. The teacher will explain to the students that today they will be learning how to create new things using boxes. The teacher will then proceed to read *Not a Box* to the students. The children will discuss which box creation was their favorite and why.

Procedures

After a discussion about the story *Not a Box*, students will be asked to build their own box creations. The teacher will ask students to pair up with another student and discuss what they would like to turn their box into.

Once the students have discussed what they will create, the teacher will set rules they must follow based on the specific standard the teacher wants to observe/assess. Example: students decide to turn their box into a house the teacher might require that the house must have a rectangle door and a two square windows. In this example the teacher is assessing whether or not the students can identify shapes.

Closure

Students will take turns sharing their creations with the class. Students will explain what materials they used and what they created. During this time the teacher will assess if students have met the requirement set.

Adaption

This lesson can easily be adapted to older grade levels by making the criteria more specific. For example, a first grade student might be asked to measure the size of the windows by creating two windows that are the exact length or a fourth-grade student might be told that the length of the windows when multiplied must equal 36.

Resource List

Resources that would be helpful to this project would be a guest speaker such as an engineer who can discuss their career with students and explain how many of the concept's students are using are used in their job.

The public library would be another great resource to use to check out books according to the project students are building ex: students are building a rocket and checking out books about actual rockets and what they look like and the internet to research their projects.

Book list:

- *Not a Box* by Antoinette Portis
- *Rosie Revere, Engineer* by Andrea Beauty
- *Iggly Peck, Architect* by Andrea Beauty
- *What if Everybody Did That* by Ellen Javernick
- *Why Should I Recycle* by Jen Green
- *Boxitects* by Kim Smith
- *Be a Maker* by Katey Howes



