**Lesson 4: Title:** FODly Yours

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| **Lesson** | **Title & Short Description:** | **Learning Outcome:** |
| #4 | FODly Yours:  F.O.D. is actually all around us. Students will be introduced to the concept that anything left out-of-place could be considered F.O.D. It can cause damage, hurt someone, or be unsafe. (GIF of mom falling on toys.) | Students will pick a room in their home & identify the potential FOD they find there.  They will create an organizational system to show how the situation might be improved. |

**Problem statement: *How can we improve our production process so that we have less debris (foreign object debris or FOD) left on the airplane during the build stage and can deliver a clean, safe airplane? What turns an object into a FOD?***

**Learning objectives:** .I can identify items in my classroom or home that could potentially be F.O.D..

**Standards:** Next Generation Science Standards (NGSS), Common Core Standards (CCSS)

**NGSS:**

**5-PS1-3:** Make observations and measurements to identify materials based on their properties.

**3-5-ETS1-1:**

Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

**3-5-ETS1-2:**

Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem

**3-5-ETS1-3:**

Plan and carry out fair tests in which variables our controlled and failure points are considered to identify aspects of a model or prototype that can be improved

**CCSS**

CCSS.Math.5.NBT.B.7

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

[ELA-LITERACY.SL.5.1](http://www.corestandards.org/ELA-Literacy/SL/5/1/)

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.

[CCSS.ELA-LITERACY.SL.5.1.A](http://www.corestandards.org/ELA-Literacy/SL/5/1/a/)

Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.

[CCSS.ELA-LITERACY.SL.5.1.A](http://www.corestandards.org/ELA-Literacy/SL/5/1/a/)

Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.

[CCSS.ELA-LITERACY.SL.5.1.C](http://www.corestandards.org/ELA-Literacy/SL/5/1/c/)

Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others.

[CCSS.ELA-LITERACY.SL.5.1.C](http://www.corestandards.org/ELA-Literacy/SL/5/1/c/)

Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others.

**Soft Skills:**

Listening, Critical Thinking, Collaboration, Communication (written and oral), Creativity & Innovation

**Materials:**

* Unit Powerpoint
* Microsoft Forms
* Note catcher

**Lesson preparation:** Method to collect data in the t-chart

**Time required:** 1 class period, with review of homework the next class period

**Grouping of students for instruction:**

Students will be placed in groups of 3-4 people.

**What is the instruction? Consider the PBL procedure that is being addressed here:** The students are still in the ‘exploration’ phase of the PBL unit. They are building their background knowledge about what F.O.D is and the importance of being organized so that the process is efficient. They will learn later how this not only saves time but also money for the company.

**Understanding the Problem**

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| --- | --- |
| **Teacher** | **Student** |
| Introducing the problem launch using a video. Providing resources that give background and meaning to the problem through the following sites… | Researching elements around the launch and then defining what the problem actually is. Students will… |
| Facilitating a discussion in groups and the whole class using the following protocol… | Brainstorming what they already know and what they need to know about this problem… |
| Background Knowledge-What is FOD? | Anything left-out of the space is called FOD |
| Teacher will share a picture |  |
| Look at the picture for  I notice/I wonder | |  |  | | --- | --- | | I notice | I wonder | | People ate, they seem to have dropped their dirty trays in the lunch lady’s general direction, instead of putting them away. | Why didn’t they follow the directions? | |  |  | |  |  | |
| What is FOD in the picture? | Trays |
| Why do you think it is FOD? Students will be provide a t-chart so they can differentiate whether it is belongs to the room or not | These trays shouldn’t be on the floor  T-chart   |  |  | | --- | --- | | Belongs in the room | Doesn’t belong here | |  |  | |  |  | |
| Draw a picture and write your plan to manage this situation. | Students will create a plan to show how the situation is improved. |
| Homework |  |
| Pick a room in your house and do a FOD walk | Students will pick a room |
| Report on the next day/class period: Did you find any FOD? | Students will find (Various answers)FOD -Legos, small toys, paper clips, etc. |
| Why do you think it is FOD? | Fod can cause an accident. You can trip on it and can fall. It can get caught in the vacuum |
| Similarly, in an airplane, FOD can result in an accident, FOD can be little or big things. | Next we will start to think about ways to control FOD from happening in the future within those systems/rooms at home. |

**Accommodations:**

**Extensions:**  The class could compile a comparison chart to see if there are any repeated types of examples of FOD. This could lead to a discussion about the purposes of those materials and if any changes should be made to the materials themselves.

**Assessment:** Monitor understanding of student concepts related to FOD and its sources.

**References/Resources:**