Food Contamination:
Testing The 5 Second Rule

Annotation
In this lesson students will test the urban myth: If food is accidentally dropped and lands on a dirty surface and is retrieved in under five seconds is it contaminated? Students will drop foods onto a known contaminated surface for various time exposures. Samples from foods will be taken and incubated on a petri dish overnight. Plates will be looked at for contamination and time points will be compared.

Problem: Is food that touches a dirty surface for less than five seconds contaminated?

Hypothesis: Foods that come in contact with dirty surfaces will have contaminates (Bacteria, Fungus or Mold) on them.

Assessed GPS:
SCSh1. Students will be able to use tools and instruments for observing, measuring, and manipulating objects in scientific activities.
b. Develop and use systematic procedures for recording& organizing information.

Amount of time:
2 class periods

Materials
A food source (Try moist food (luncheon meat) vs. dry food (dinner role).
Petri Dishes
LB Agar
Microwave (To heat the agar)
Q-Tips
Clean Water
Incubater (37 degrees Celsius)
Timer, stop watch or watch with second hand
500mL Flask
Scale and weigh boats
A known dirty surface (floor)

Background Research
Ask the class about their understanding of how food becomes contaminated. Also ask which bacterias contaminate foods and discuss such foods like E. coli, Salmonella and Listeria.

FOOD CONTAMINATION: TESTING THE 5 SECOND RULE

1. **Procedure**
   Pour 250mL of water into the 500mL flask. Add ~ 10g of agar to the flask and heat for 1.5 min or until agar solubilizes with water. Pour liquid into petri dish (BE CAREFUL, LIQUID IS VERY HOT). Allow to cool (~15-20 min)

2. Place food on contaminated surface for 2 sec. and 6 sec. Take the Q-tips and moisten it with water run it across the surface of the food, particularly where the food touched the dirty surface. Then run the Q-tip in a zig-zag fashion across the agar plate.
   Place plates into the incubater overnight at 37 degrees Celsius.

3. Compare the plates at various time points and count the colonies or estimate a percentage of contamination for each plate. This is your data.

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Conclusion
Discuss the results with the class.

Notes:

The reasoning for 2 and 6 seconds is because we are actually testing the time point of 5 seconds. Two seconds represents a time point that is less than 5 seconds and if there is no contamination at this time point then the 5 second rule stands. If there is contamination at 2 second, the myth is busted.

The sample taken at 6 seconds represents a time control. If 2 seconds is positive for contamination then the 6 seconds should be also. This further busts the myth.

If 2 seconds is negative but 6 seconds is positive then the 5 second myth stands and a time greater than 5 is required for food to be contaminated.

If both time periods are negative, then a greater time period is need to potentially have contamination.

Based on the results, ask the students questions pertaining to these mentioned points. Also, if there is a difference between contamination of moist foods vs. dry foods… why?