Name: _____ Period: _____ Date: _____

Lab Safety Lab Activity 1 – Teacher Edition

"NUTS ABOUT LAB SAFETY!"

Introduction

Wearing the proper personal protective equipment is important. The focus of this lab is on safety procedures and following directions more so than the outcome of the experiment. Here, students will learn how goggles, a lab apron, and gloves can protect them from chemicals by performing two low risk labs. This will allow students to be introduced to proper lab procedure. It is encouraged that you read through and demonstrate the lab prior to allowing students carry it out. A total of 7 groups/benches with 4 students to a bench (i.e., two sets of pairs) is the ideal grouping for this lab.

Pre lab prep for teacher will involve setting up the materials for each table:

Materials:

- **Polystyrene packing peanuts**
- **Cornstarch packing peanuts**
- **Acetone** (fingernail polish remover)
- **Petri dishes, 8 per table** (students will be working with a lab partner so, four dishes for each pair of students)
- **4 beakers per table, (2 per group)**
    - Add 200mL of water in one beaker. Carefully pour 100mL of Acetone into the other beaker. (These maybe prepared prior to the lab session with clear labels.
- **4 glass droppers per table**. Each lab group (2 students) will need one dropper (transfer dropper) for the water H_2O and one for the Acetone.
- **Each table should have two plastic bowls placed centrally and clearly labelled with their type of packing peanuts.** One bowl should contain polystyrene packing peanuts and the other bowl the cornstarch peanuts. Both lab groups at each lab table can share the packing peanuts from each bowl. Each bowl should contain between 10 to 15 packing peanuts.

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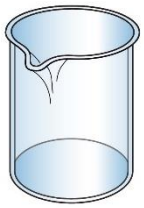
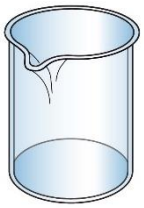
- Once each of the stations are prepared and have all the appropriate equipment organized and labeled and ready for students to use you may want to double check all equipment is in its proper place.

Packing peanuts of two types:

- **Polystyrene**
- **Cornstarch**



2 x beakers of labelled acetone



2 x beakers of labelled water

4x Petri dishes

2 x Droppers

Students should be reminded of and referred to any relevant safety posters in the room to help them follow lab safety procedures and always keep safety equipment on.

- Students will place one cornstarch peanut and one polystyrene peanut into separate Petri dishes.
- Encourage students to predict what will happen (before you demo the lab) when they place two droppers of water over one Petri dish and two droppers of acetone over the other Petri dish. (Be sure to keep droppers separate for water and acetone.)
- Have students write their prediction on the lab sheet.
- Students will then fill out the results chart with their observations.

Learning objectives:

By the end of this lesson, students will be able to:

- Outline the first aid procedures for dealing with chemicals on the skin and in the eyes.
- Demonstrate how to correctly use chemical wash stations and eye wash stations.
- Correctly smell a chemical by wafting.

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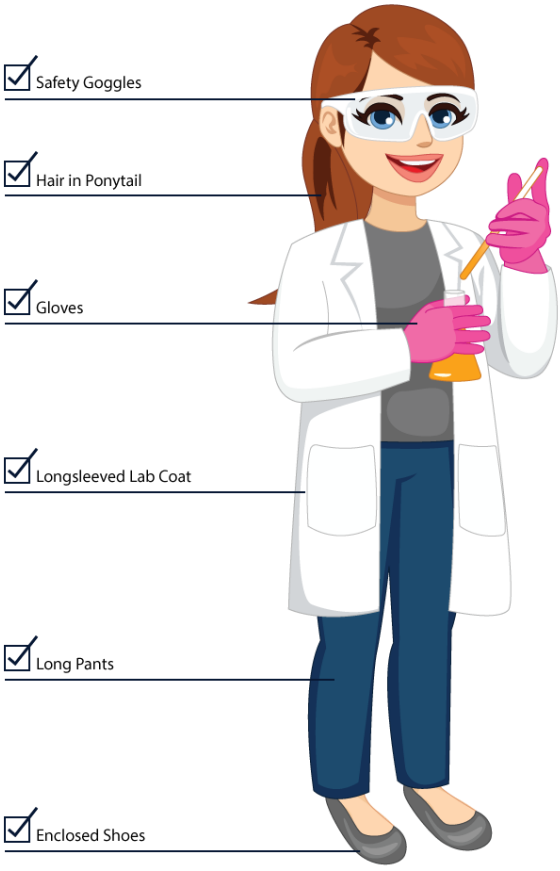
Instructional Preparation:

1. Make sure students are wearing closed toed shoes.
2. Students with long hair must have it tied back neatly and out of the way.
3. Students will don (put on) their goggles, lab apron and gloves.
    - Remind them not to remove any of these until the lab is completed, cleaned up, and you have instructed them to do so. (You may have to remind students to keep goggles on over their eyes.)
4. Remind them not to pick up any lab equipment or begin until they are instructed to do so.
5. Assign students and lab partners to each table.
6. Once students are at each table have students read the lab procedures completely with their lab partner. (Use this as an opportunity to emphasize that you should read all the procedures before you begin any lab.)
7. The students will complete the lab as follows:



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Introduction:

Wearing the proper personal protective equipment is important! In this lab we will learn how goggles, your lab apron, and gloves can protect you from chemicals.

Learning objectives:

By the end of this lesson, students will be able to:

- Outline the first aid procedures for dealing with chemicals on the skin and in the eyes.
- Demonstrate how to correctly use chemical wash stations and eye wash stations.
- Correctly smell a chemical by wafting.

Materials:

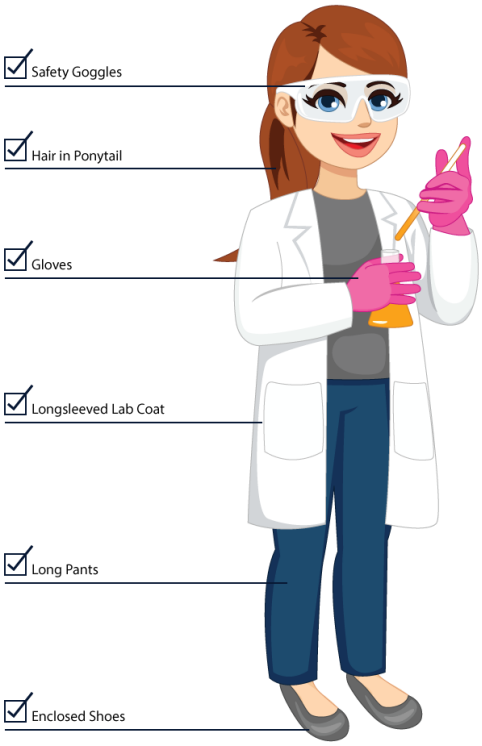
- Polystyrene packing peanuts
- Cornstarch packing peanuts
- Acetone (fingernail polish remover)
- Water
- 4 Petri dishes
- 2 beakers
- 2 glass droppers

Safety

1. Ensure you and your partner correctly have:
    - closed toed shoes
    - long hair tied back neatly and out of the way.
    - safety goggles, lab apron and gloves on.

    Note: Do not remove any of these until your lab is completed, cleaned up, and you are instructed to do so by your teacher!

2. Read all the instructions and do not pick up any lab equipment or begin until you are instructed to do so!



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Lab Procedure:

1. Place one cornstarch peanut and one polystyrene peanut into two separate Petri dishes.
2. Read step three and write down your prediction of what you think will happen in each Petri dish.
3. Place two droppers of water into one petri dish and two droppers of acetone into the other petri dish. (Be sure to keep your droppers for water and acetone separate)
4. Record your results in the chart provided.

Prediction:

Students will record their prediction here.

Results:

	Water	Acetone
Cornstarch Peanut	**Defoamed the peanut**	**Peanut was unaffected**
Polystyrene Peanut	**Peanut was unaffected**	**Defoamed the peanut**

Post-Lab Discussion:

Discuss the relationship between the Solvent (Acetone) and Solvate (Peanuts).

Also discuss what happened to each of Solvate and describe the reaction.

Packing peanuts are used for packing material, they come in two types Styrofoam and cornstarch (a biodegradable natural polymer). Packing peanuts are purposely made to be full of gas pockets to make them lightweight and shock absorbent. You can chemically remove the gas pockets by using a

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solvent to defoam the material. Acetone is the solvent for Styrofoam. Water is the solvent for the biodegradable cornstarch peanuts. The solvents work seeping in-between the solid polymer networks which causes the polymers to soften. The peanuts to collapse as they defoam and the trapped gas escapes.

Post-Lab Questions:

1. Circle the **four most important** lab safety expectations for this lab

A.	Read the instruction	F.	Waft (Save your nose hairs)
B.	Clean up all messes	G.	Wear Goggles
C.	Organize your lab	H.	Lose the Comedy routine
D.	Handle Chemicals Carefully	I.	No Eating during the lab
E.	Practice good fire safety skills	J.	Protect your skin with gloves

2. What chemical would you use to dissolve a polystyrene peanut?

   Acetone

3. What solvent dissolved the cornstarch peanut?

   Water

4. If you should spill a strong acid on your pants and shoes what 3 things should you do?
   a) **Remove any clothing that may be wet from chemicals.**
   b) **Rinse the affected area with water at the wash station continuously for 15 minutes.**
   c) **If pain persists or rash or allergic reaction occurs head to the nurse with a copy of the MSDS.**

5. If a student accidentally inhales fumes from a strong chemical what should you do?
   a) **Remove them from the room to get fresh air.**
   b) **If they continue to have trouble breathing or stop breathing get the school nurse and administer CPR.**
   c) **If irritation persists take the student to the nurse with a copy of the MSDS.**

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