

CHEM SQUAD TEACHER MATERIALS LIST

Description

As members of a Dangerous Goods Emergency Response Team investigating a chemical spill accident, students test several “hazardous” substances over 4 sessions to determine their physical and chemical properties to identify the mystery spill.

Materials supplied by TELUS World of Science - Edmonton:

- Citric Acid
- 10 Spot trays
- 100 pH strips
- pH Legend cards
- WHMIS homework printout (to be emailed)
- Observation Chart (to be emailed)

Required Materials (keep the chemicals **secret** from students):

- $\frac{1}{4}$ cup Baking Soda
- $\frac{1}{4}$ cup Powdered Laundry Soap
- $\frac{1}{4}$ cup Sugar
- $\frac{1}{4}$ cup Cornstarch
- 1 cup distilled water
- 1 cup of vinegar
- Dropper bottles (1 per group) or cups and eye droppers (1 per group) for distilled water
- Dropper bottles (1 per group) or cups and eye droppers (1 per group) for vinegar

Suggested Materials:

*****Safety glasses are recommended for all activities with chemicals*****

- Student magnifying glasses
- Computer, tablet or phone

Session One: WHMIS Training

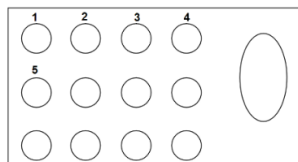
Materials:

- WHMIS homework printout
- Personal devices (tablets, Chromebooks, laptops, mobile phones, etc.) - optional

Session Two: Chemical Testing Day 1

Prep Instructions:

- Hand out observation chart
- Scoop about 1/2 tsp (5g) of each material in spots 1-5 (see diagram below). Do not tell students what the chemicals are. Prepare 1 tray for each small group of students.



- Spot 1 - Baking soda
- Spot 2 - Sugar
- Spot 3 - Laundry Soap Powder
- Spot 4 - Cornstarch
- Spot 5 - Citric Acid

Note: The **spot trays and chemicals** will need to be stored for the next session (or if that is not possible, discarded and new ones will need to be prepared for Session Three).

Observation charts will need to be kept for use in session 3 and 4.

Session Three: Chemical Testing Day 2

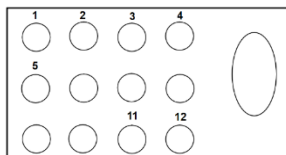
Prep Instructions:

- Count out 5 pH strips per group.
- Provide 1 pH legend to each group.
- Use the spot trays from the previous session or prepare new ones according to the instructions for Session 2.
 - After this session, the trays can be dumped out and rinsed with water. The spot trays will need to be filled again for Session 4.
- Fill dropper bottles with about 1-2 tbsp of distilled water or pour 1-2 tbsp of distilled water into a cup and provide an eye dropper. Prepare 1 dropper bottle or cup for each group.
- Handout observation charts from previous week.

Session Four: Chemical Testing Day 3

Prep Instructions:

- Scoop about 1/2 tsp (5g) of each material in spots 1-5 (same order as session 2 & 3). Do not tell students what the chemicals are. Prepare 1 tray for each group of 2-3 students



- Spot 1 - Baking soda
 - Spot 2 - Sugar
 - Spot 3 - Laundry Soap Powder
 - Spot 4 - Cornstarch
 - Spot 5 - Citric Acid
 - Spot 11 – Mystery truck spill (baking soda)
 - Spot 12 – Mystery truck spill (baking soda)
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- Spot trays can be dumped out and rinsed with water after this session.
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- pH strips – 2 per group
 - pH legend cards
 - Fill dropper bottles with about 1-2 tbsp of distilled water or pour 1-2 tbsp of distilled water into a cup and provide an eye dropper. Prepare 1 dropper bottle or cup for each group.
 - Fill dropper bottles with about 1-2 tbsp of vinegar or pour 1-2 tbsp of vinegar into a cup and provide an eye dropper. Prepare 1 dropper bottle or cup for each group.
 - Observation Charts from previous sessions.