Krug Chemistry – Deep Run Daily Planning Guide

Date of Lesson: Q1 Day 3 – SGMs and Lab Equipment CER

Topic /Big Questions: (Question Stems & Question Creation Chart)

- **What safety precautions should be taken when doing experiments?**
- **What safety equipment is available in the lab?**
- **What information is stored in an MSDS?**
- **What are the names and uses for common lab equipment?**

State SOL	Unpacking the Standards (Video explanation shown at 3:18)
CH 1	a) designated laboratory techniques; b) safe use of chemicals and equipment; c) proper response to emergency situations; g) mathematical manipulations including SI units, scientific notation,

Visible Learning (For the three items with asterisks*, think from a student perspective. Use simple language)

***What am I learning today?** Safety precautions and equipment are required at all times during chemical experiments. MSDSs store alternative chemical names, chemical and physical properties, handling and disposal requirements, and first aid information. Lab Equipment is specifically designed to meet the appropriate use.

***Why is it important?** Using safe lab practices are important for avoiding accidents. If accidents happen, knowing how to locate and use emergency equipment and MSDSs can save lives. Understanding how to use lab equipment properly is part of safe laboratory practices.

***How will I know I've learned it?** I will locate safety equipment and MSDSs in the classroom. I will identify lab equipment and use it properly.

Differentiation strategies:

Lab Safety Quiz

MSDS Investigation

Lab Equipment CER & Show and Tell

Accommodations and/or modifications are being met for students with IEP's/504's.

Small group activities; access to materials on Schoology; frequent checks for understanding; small group testing

Daily Plan/Sequence of Instruction:

Lab Safety Quiz

Students will take a 25 question multiple choice quiz on Schoology (or printed hard copy) covering safe lab practices and equipment. Student must score a 90% or higher in order to participate in future lab activities.

MSDS Investigation

Students will be divided into groups and given MSDSs for Isopropyl Alcohol that come from different companies. Students will be told to do a scavenger hunt to find alternative chemical names, lab safety signs, chemical and physical properties, symptoms of over exposure, and instructions for proper disposal. Students will record their findings on their white boards. After 10 minutes, the teacher will begin with alternate names and discuss how names are similar and different and importance of making sure you are using the correct chemical. For lab safety signs, some MSDSs will have images of signs and other will just have the written information. Discuss the fact that the pictures express information more directly and faster than making you hunt for the words. Time matters in an emergency. For chemical and physical properties, ask about boiling point. (83 degrees Celsius). Write it on the board and ask if it is larger or smaller than the boiling point of water. Then ask if you add water and isopropyl alcohol to a beaker and heat it, which will boil first. For symptoms of over exposure, discuss how to move to ventilated areas. Impress the necessity to tell the teacher if you have any symptoms. For disposal, MSDSs will all have some form of lawyer talk, such as "follow state and federal regulations", but it won't tell you what the regulations are. If students actually look up the disposal instructions, they will find it says "evaporate in a fume hood."

Lab Equipment CER & Show and Tell

Before class set up different stations of lab equipment. Equipment at each station should be related in some way. For example:

- Station 1 – Beaker, Erlenmeyer, volumetric flask, graduated cylinder
- Station 2 – Crucible and lid, evaporating dish, watch glass with beaker, and mortar and pestle
- Station 3 – Ring stand, iron ring, wire gauze, clay triangle, test tube clamp. Add a small beaker that will fit inside iron ring (forcing the need for wire gauze), a crucible, a test tube, and a Bunsen burner with attached hose.
- Station 4 – Volumetric pipette, plastic pipette, burette, test tube
- Station 5 – Digital balance, analytical balance, triple beam balance, quadruple beam balance
- Station 6 – Bunsen burner, burner stand, hot plate
- Station 7 – Large plastic funnel, small glass funnel (for top of Burette), regular funnel with filter paper, and wash bottle

For the CER, students are NOT expected to know the names. Tell them not to look up the names and you will walk around and tell them the names later before the show and tell time. First they need to focus on the use of each piece of equipment. Each student will chose one piece or set of lab equipment that goes together and create a CER: **Claim** = This equipment is used for… **Evidence** = characteristics like size, shape, openings, settings, level of precision, etc. **Reasoning** = explain what the benefit of each characteristic is or how that helps it be used. Teacher will assist as needed. For the Show and Tell part, each group will go the front of the room with their lab equipment. Have students say their names loudly. One at a time, have students explain the CER for their piece of equipment. Add information as needed. Ask questions as to why one piece of equipment may be more appropriate to use than another for the desired purpose. When all students are finished talking, say "QUIZ TIME" and make the class repeat their names! It's a lot of fun and it students feel special when their name is remembered.

Assessments (List all formative/summative assessments used to check for understanding during this lesson. Summative assessments may occur during a different class period.):

Lab Safety Quiz (summative)

MSDS Investigation (formative)

Lab Equipment CER & Show and Tell (formative)

After assessing today's lesson are you and your students comfortable moving forward with your next objective?

Yes – students scored 90% or higher on the lab safety quiz and participated in group activities

No, remediation required to proceed – students, who scored less than 90% on quiz, can retake it during One Lunch