

The background features a dark blue gradient with faint, light blue circular patterns and numbers. The numbers, including 40, 150, 160, 170, 180, 190, 200, 230, 240, 250, and 260, are arranged in a circular fashion, suggesting a clock face or a circular scale. The overall aesthetic is technical and scientific.

THINKING BEYOND THE LECTURE

LEARNING TO LOVE BIOLOGY
THROUGH THE EYES OF A NON-MAJOR

CTL SUMMER INSTITUTE - 2023

LET'S MEET TODAY'S PRESENTERS

- Ms. Emily Coon-Frisch
 - excsbi@rit.edu



- Mrs. Michelle Weatherell
 - mlmsbi@rit.edu





HERE'S A LITTLE INSIGHT ON "OUR" COURSE

- Non-majors General Education Lecture Course
 - with "optional" complementary lab course
- 2 course sequence (Fall & Spring Semesters)
- Consists of:
 - 1st thru 5th years
 - >60+ majors
- Style:
 - Before 2019-2020 AY - Traditional Lecture
 - 2019-2020 AY to Present – Active Learning

The background is a gradient of purple and blue, overlaid with numerous small, colorful splatters and larger, faint technical graphics. On the right side, there are circular gauges or dials with numerical scales (e.g., 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210) and arrows. There are also dashed lines and other geometric shapes scattered across the scene.

PART ONE

TEACHING MAJORS VS NON-MAJORS

WHAT DO YOU THINK IS THE BIGGEST DIFFERENCE BETWEEN MAJORS AND NON-MAJORS?

- Working in Groups of 2-3.
- Take 5 mins. to discuss what you think is the BIGGEST difference between teaching majors and non-majors.
- Write “your” thoughts on your white boards.



**WHAT DO YOU THINK IS THE BIGGEST DIFFERENCE
BETWEEN MAJORS AND NON-MAJORS?**

LET'S SEE WHAT YOU'VE COME UP WITH.



REFLECTION QUESTION #1

Answer on your notecard

Do you believe you need to have a different classroom pedagogy when teaching majors vs. non-majors?

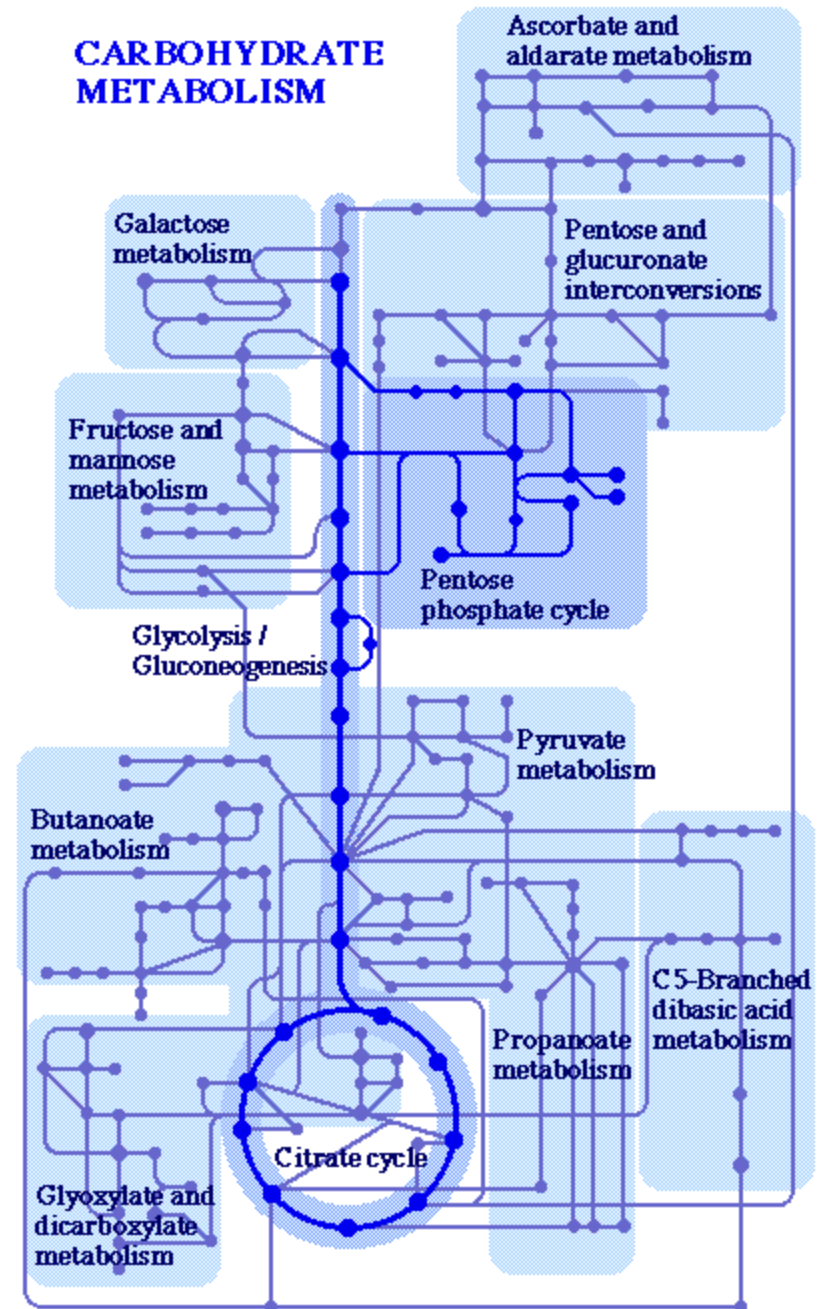
If so, why?

The background is a gradient of purple and blue, overlaid with numerous splatters of various colors and sizes. On the right side, there are several technical diagrams, including a large circular gauge with a scale from 0 to 200 and a needle pointing towards 180, and another smaller gauge below it. There are also some faint circular patterns and arrows scattered throughout the image.

PART TWO

SHALL WE GET OUR ACTIVITY ON?!?

SCIENCE IS
SCARY...RIGHT?



STAND BACK



**I'M GOING TO TRY
SCIENCE**

**LET'S MAKE A SCARY
TOPIC,
A LITTLE LESS
SCARY...**

ALLERGY WARNING!!!

We will be working with
Latex balloons in today!

If you are allergic, you need
to let your presenters know!



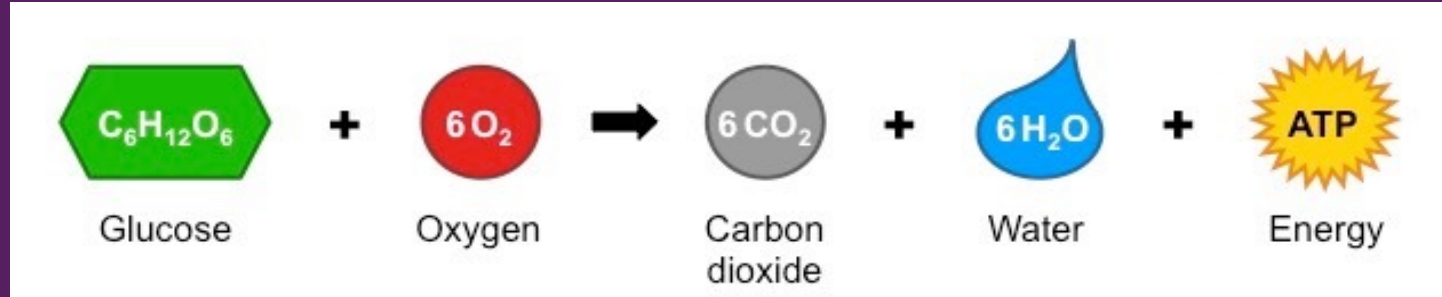
ALLERGIC REACTIONS

Skin Contact	Injection	Ingestion	Inhalation
 poison plants	 bee sting	 medication	 pollen
 animal dander	 medication	 nuts & shellfish	 dust
 pollen			 mold & mildew
 latex			 animal dander

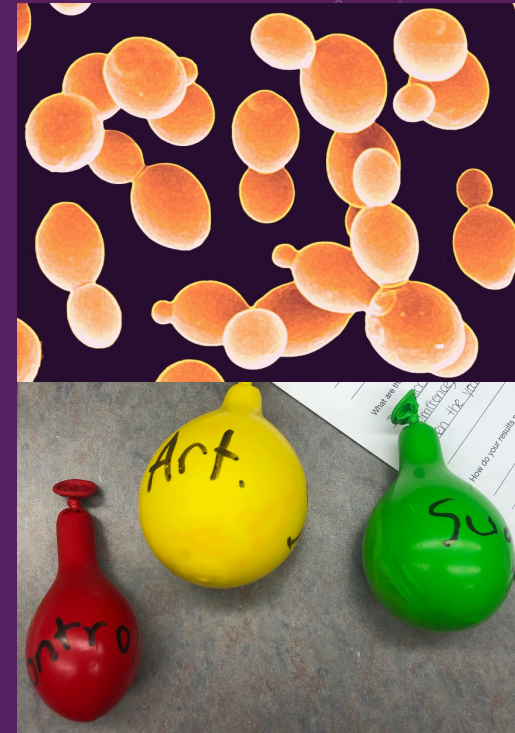


ADAM.

CELL RESPIRATION EXPERIMENT



- The purpose of this experiment is to understand the rate of production of CO₂ in the process of cellular respiration using yeast as the cell.
- Biologics:
 - Yeast – “Rapid Rise”
 - *Saccharomyces cerevisiae*, or “sugar-eating fungus”
- Treatments:
 - Table sugar (Sucrose)
 - Various types of sugar substitutes and other sugar sources



YEAST BALLOONS...GETTING STARTED

- Step 1: Make sure you have all of your supplies

- 3 – Latex Balloons
- 1 – Plastic Funnel
- 40°C Water
- 3 - Vials of yeast
- 2-3 Plastic Pipets
- 3 - Pieces of yarn
- 1 - Vial of sucrose
- 1 – Plastic Beaker
- 1 – Ruler
- 3 – Black Markers

- Step 2: **Develop your experimental design and your hypothesis**

- You have everything you need to set up a positive and negative control, as well as an experimental treatment. What would those look like?
 - *Hint: Every balloon should have yeast but not every balloon will have sucrose...*
- Use the contents of your bin to determine which sugar alternative you want to use as your experimental treatment.

SUGAR VS. SUGAR SUBSTITUTES...

WILL THERE BE A DIFFERENCE?



YEAST BALLOONS...TIME TO EXPERIMENT!

- Step 3: Set up your experiment
 - One person from your group - come to the front and fill your beaker of water
 - You will need ~10.0 mL of water per balloon
 - Fill the balloons based on your experimental design in part 2
 - Hint: They should all have at least water and yeast in them.
- Step 4: Incubation
 - Let sit for the duration of this session...watch them grow!
 - Take pictures and note the time as you notice big changes



The background is a gradient of purple and blue, overlaid with numerous small, colorful splatters and larger, faint technical diagrams. These diagrams include circular gauges with numerical scales (e.g., 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220) and various geometric shapes like circles and lines, suggesting a scientific or engineering theme.

PART THREE

TEACHING A LARGE ENROLLMENT COURSE WITH ACTIVE LEARNING

WHAT ARE YOUR BIGGEST CONCERNS TEACHING A LARGE ENROLLMENT, ACTIVE LEARNING COURSE?

- Working in Groups of 2-3.
- Take 5 mins. to determine “your” biggest concerns are about teaching a large enrollment, active learning course.
- Write the groups thoughts on your white boards.

The background is a dark blue gradient with faint, light blue technical graphics. These include several circular gauges or dials with numerical scales (e.g., 150, 160, 170, 180, 190, 200, 210) and arrows. There are also dashed lines and solid lines forming circular patterns, suggesting a technical or scientific theme.

WHAT ARE YOUR BIGGEST CONCERNS TEACHING A LARGE ENROLLMENT, ACTIVE LEARNING COURSE?

LET'S SEE WHAT YOU'VE COME UP WITH.



REFLECTION QUESTION #2

Do you think you can utilize the same active learning teaching methods regardless of the class size?

Elaborate.

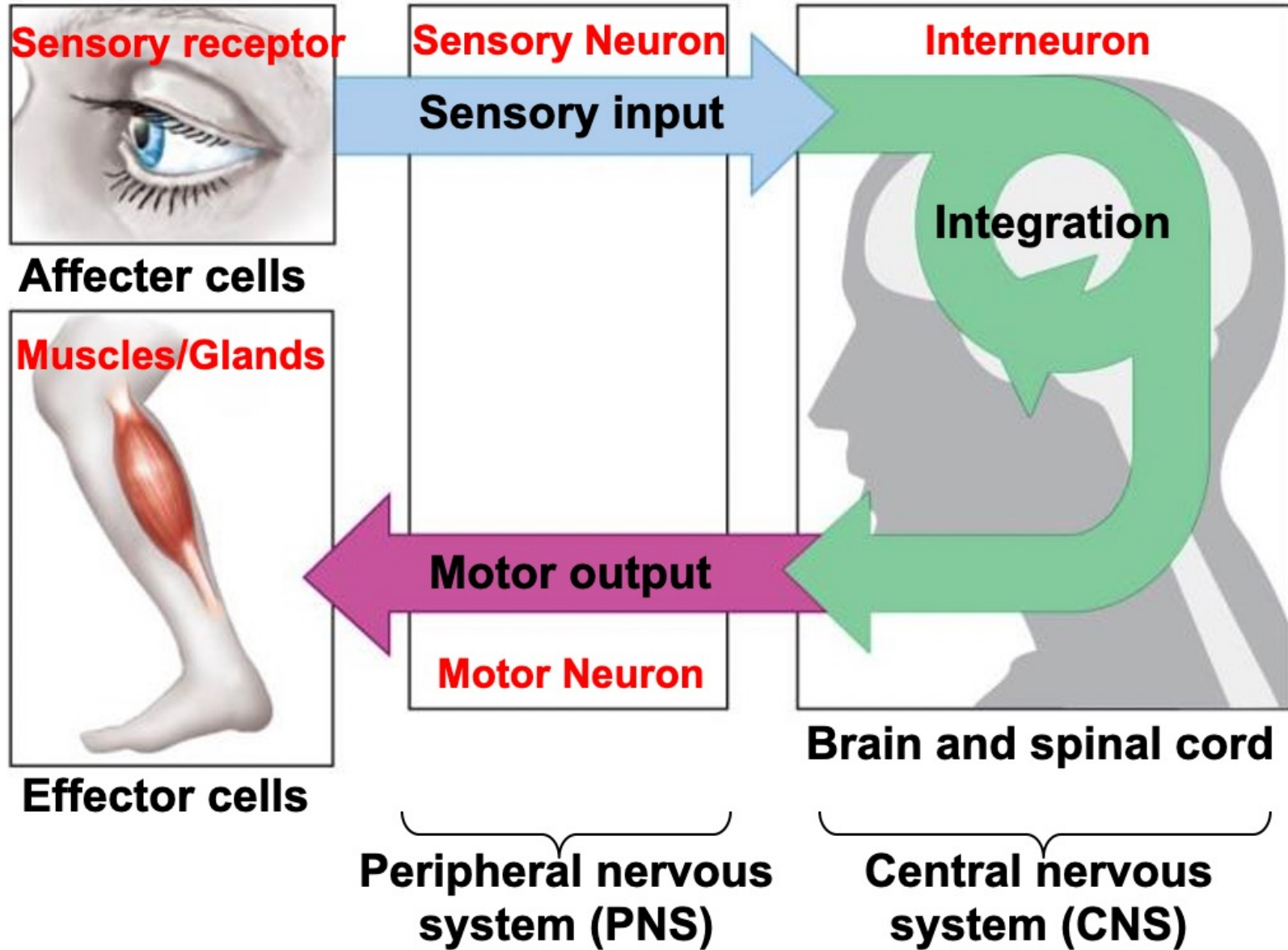
PART FOUR

MAYBE THERE'S TIME FOR ANOTHER ACTIVITY...
AFTERALL, THE MORE HANDS ON THE BETTER...RIGHT?

SENSORY INTEGRATION AND PERCEPTION

- Information from both the general senses and the special senses is integrated by our brains to help us make sense of our surroundings.
- We are usually unaware of how multiple senses are employed in this integration.
- This simple demonstration will allow you to see how taste, smell, and vision are integrated when we determine flavor.





NOW, IT'S TIME FOR A SNACK

- Obtain one package of Gummy Bears per person.
- Divide into pairs.
 - Each pair will consist of a “taster” and a “recorder.”
- To start, have the taster:
 - Close their eyes and plug their nose
 - Consume “1” Gummy Bear from their package
- Once, swallowed (keeping eyes closed & nose plugged, have them Identify the flavor (to the best of their ability)
 - Record their confidence level on a scale of 1-5
 - 5 = highest confidence; 1 = lowest confidence
- Repeat protocol with two more gummy bears with eyes closed and nose plugged.



LET'S CONTINUE OUR TASTE TEST

- For the next round:
 - the taster should have open eyes but keep their nose plugged.
 - Repeat for 3 bears with nose plugged.
- Final Round:
 - Eat the gummy bears with no inhibition of the sense.
 - Repeat with 3 bears.
- Switch taster and recorder and have the other group member in the pair go through the same protocol.
- Compare your confidence level with your peers and answer the questions on the worksheet



The background is a solid purple color with several faint, light-colored technical diagrams. These include circular gauges with numerical scales (e.g., 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210) and arrows, as well as concentric circles and dashed lines, suggesting a scientific or engineering context.

**WAS THERE A DIFFERENCE IN YOUR
ABILITY TO PERCEIVE “FLAVOR”
THROUGHOUT YOUR TRIALS?**

WAIT...WHAT ABOUT THE YEAST?

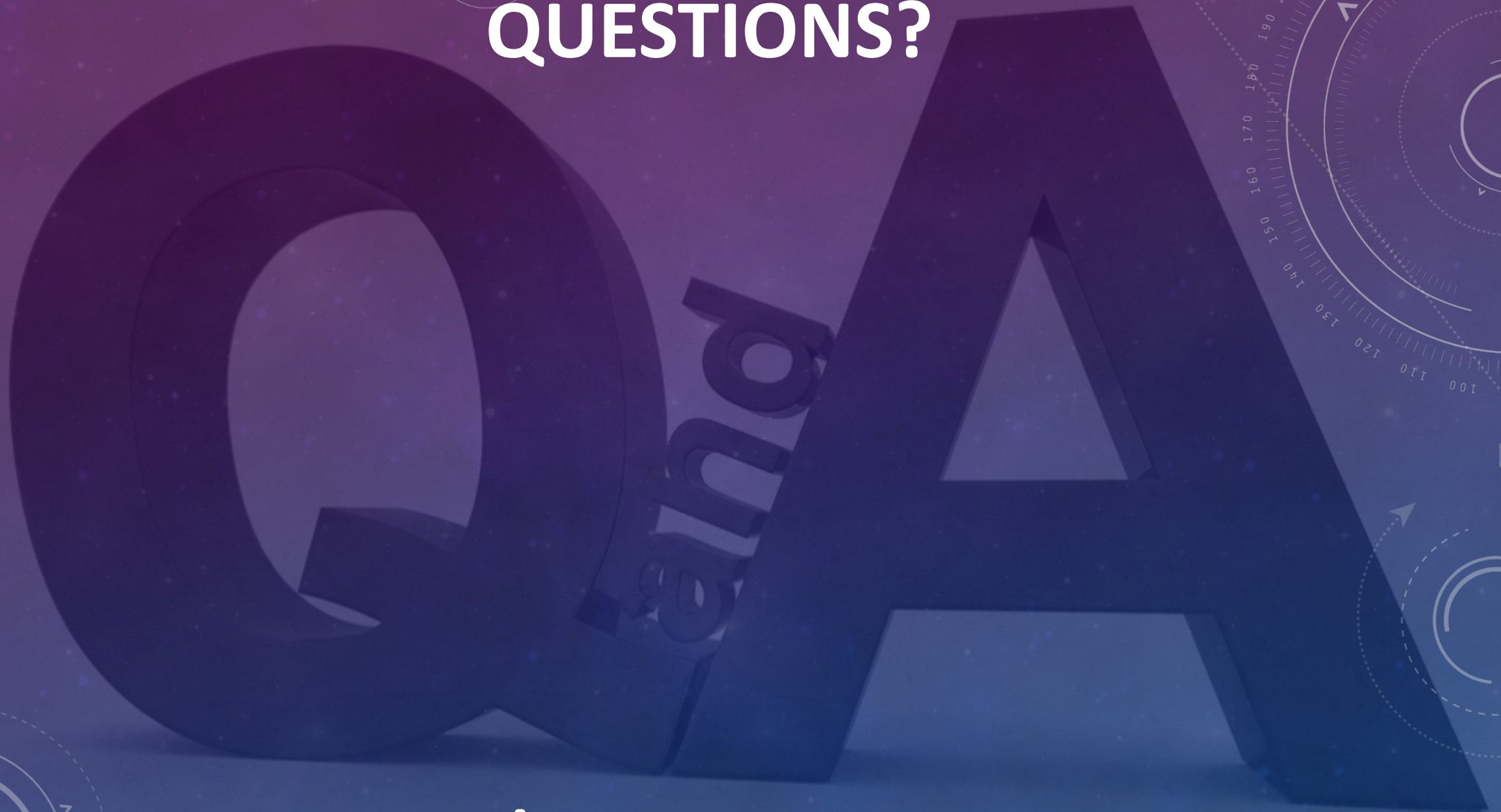
BEFORE WE WRAP THINGS UP... HOW ARE YOUR BALLOONS DOING?

- Step 5: Results and Analysis
 - Read and record the results on your data table in your worksheet
 - Rulers are in your bins 😊
- Let's take a moment to discuss your results among the groups
 - What kind of trends did you see in your balloons?

FINAL THOUGHTS

The background features a dark blue gradient with a field of small white stars. Overlaid on this are several technical diagrams: a large circular gauge with a scale from 80 to 210 and a needle pointing to approximately 190, located in the upper right; a smaller circular gauge with a scale from 100 to 140 and a needle pointing to approximately 130, located in the lower right; and a dashed circular arrow pointing left, located in the lower left. There are also some faint, partially visible circular elements in the top left.

QUESTIONS?



MAYBE WE'LL HAVE SOME ANSWERS



REFLECTION QUESTION #3

Please share your thoughts on
this workshop

Favorite part? Least favorite?

