STAGE 1 – DESIRED RESULTS

Unit/Module: _Introduction to Carbohydrate Structure __
Learning Outcomes: Students should be able to interconvert between the three common structural models used to depict carbohydrates. (Fischer, Haworth, Chair)

Essential Questions:
How does a linear carbohydrate (Fischer projection) cyclize to form either the furanose or pyranose forms?
How does that process give rise to the anomeric position?
How do you determine which isomer is made (alpha vs beta)?

Resources
What resources can be made available to your student to support their active learning? that formats are best suited to complement your course material?
Students are asked to bring their molecular model kits (helps visualize switch form Haworth to chair conformation)
To lead the example I will use powerpoint and and my tablet to draw on the slides

STAGE 2 – ASSESSMENT EVIDENCE

Evidence of student learning (formative/summative)
How will you assess students' prior knowledge?
Ask them at the start if they have heard of Fischer or Haworth projections (should be familiar from organic chemistry)
What criteria will be used to assess student performance?
Students will be assess on their ability to correctly draw the interconversion and predict the stability of each isomer
What evidence will be collected to demonstrate achievement?
The worksheets will be collected at the end of the lesson

- Their results on the worksheet will determine if the next session will start with a short review.

The next course exam will have questions related to carbohydrate cyclization.
How will students reflect and self-assess their learning?
The graded worksheet will be returned to students the next class time. Students will be encouraged to correct their work.
As part of the exam review sheet, questions on carbohydrate cyclization are included

STAGE 2 – ASSESSMENT EVIDENCE	
STAGE 3 – LEARNING PLAN	
Anticipatory Sets/Hooks *How will you introduce the material and capture their attention?* Open by discussing the ratio of linear and cyclic sugars in solution. Why are cyclic sugars so stable?	*List the steps in chronological order to create a timeline of what will occur in your lesson.* *Consider how each of the components on the left will be included in your lesson if applicable.* 1)Introduce different forms of carbohydrates (linear vs cyclic) and prime students to remember different representations (Fisher & Haworth projections, and chair conformations) from organic chemistry (5 min) 2)Pass out the carbohydrate cyclization worksheet 3)Explain the steps on the worksheet by walking through the glucose example on the projector screen using the ipad (5 min) 4)Have students work through worksheet on their own for 10 min (while students are working, go around and ask questions/check progress) 5) Pair students up and have them compare/explain their answers (10 min) (while students are working, go around and ask questions/check progress) 6) Collect worksheets
Teacher Modeling *What instructional content and techniques will be incorporated into this lesson?* *This lesson combines lecture (anticipatory sets/hooks) with worked examples*	
Guided Practice *How will you scaffold information for your students?* Instructions are located on the worksheet and I will walk through the steps using an example *How will collaborative learning be used?* Students will check their work with each other and provide feedback to each other	
Learning Activities *How will students actively engage with the material?* *How will students work towards achievement of the learning outcomes?*	
Independent Practice *How will students show evidence of learning?* Students will compare answers on the worksheet so their independent evidence will come on later summative assesments	

STAGE 2 – ASSESSMENT EVIDENCE	
Reflection *What have you learned about your teaching and content covered in this unit?* *What changes or adjustments could you make?* *What were the strongest features of your unit?* *What are your overall reflections in the course to this point?* This was administered as a standalone unit as an assignment in the course teaching college science. Before reflections and changes to the course are made the worksheet should be trialed in an actual course with actual students	
Conclusion and Preview *What should students take away from this lesson?* Students should be able to interconvert between different carbohydrate depictions. *What will happen next? Why?* In the next class they will learn why the cyclic form dominates the linear form.	