

**Lesson Plan Template**

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| **Name: Christopher Coleman** | | **Program: Student Teaching** | | | **Course: Geometry** |
| **Lesson Topic/Title: Reasoning and introduction to logic and conditional statements** | | | | | |
| **Lesson Date: 08/30/16, 09/01/16, 09/05/16** | **Lesson Length: 90 Minutes (3 class periods)** | | | **Grade/Age: Grade 8/ 13-14** | |
| **Learning Objectives (Targets):**   * Understand the vocab of the first two sections of the chapter (inductive reasoning, conjecture, counterexample, hypothesis, conclusion, negation, perpendicular lines, conditional statement) * ­Are able to recognize patterns and make educated predictions. * Will understand how to transform if-then statements into the converse, inverse, and contrapositive of that statement. * Justifying answers through postulates * Able to construct thoughts that correctly argue why diagrams are constructed the way they are | | | | | |
| **Standards:**  Math Standards  [CCSS.MATH.CONTENT.HSG.CO.C.9](http://www.corestandards.org/Math/Content/HSG/CO/C/9/) Prove theorems about lines and angles.  [CCSS.MATH.CONTENT.HSG.CO.C.10](http://www.corestandards.org/Math/Content/HSG/CO/C/10/) Prove theorems about triangles.  [CCSS.MATH.CONTENT.HSG.CO.C.11](http://www.corestandards.org/Math/Content/HSG/CO/C/11/) Prove theorems about parallelograms.  ISTE Standards  11.2 & 11.5  Teaching Standards   * Learning Environments * Innovative Applications of Content * Collaboration | | | **Standards Alignment & Justification:**  This lesson is all about providing relevant background knowledge in order to begin to understand and develop student skills in completing and understanding proofs. They will also be introduced to perpendicular lines in this lesson, a fundamental concept in proving theorems about lines and angles.   This lesson provides the framework for higher level thinking and fully understanding what a proof is in mathematics and the logic behind them.  I have met the ISTE standards in this lesson by introducing new technology to myself and the students. I found out about Plickers by communicating with a former classmate and hearing about her successes in the classroom with it. It is this type of communication that proves I have met the ISTE standards. I also have been using Quizizz as a tool for students to have practice assessments outside of the classroom. Not only does it simulate a quiz for them, but it compresses all of their answers into a nice excel sheet so I know exactly where to pick up and what to review at the start of next class.  As for meeting the teaching standards I have met learning environments by providing partner work this lesson as well as a safe environment where students come up to the board to share their answers.   For the Innovative Applications of Content, I’m having students do a small art project where they have to manipulate conditional statements and draw pictures regarding each one.   For collaboration, one of the technology activities that I’ve done ( Plickers) other teachers are curious what it is and are planning to come in to observe what I’m doing. This promotes an open environment and encourages continuous learning for professionals and students alike. | | |
| **Assessment: ~~❏~~** Pre ~~❏~~ Formative  ~~❏~~ Summative ~~❏~~ Student Self  Pre : Fist-to-five, Plickers, previous test, entrance ticket,  Formative: Graphic Organizer, Quizizz, storyboard art, 3-2-1 report  Summative: Quiz (graded) | | | **Assessment (Data & Student Feedback):**  The students will have just taken a test on chapter 1 and will prove as my pre-assessment in determining the pacing of my teaching for chapter 2. In addition to the other pre-assessments I will be conducting, there will be a Kahoot, and a fist-to-five evaluation of previous knowledge on the content.    For formative assessments students will be completing a graphic organizer, to help organize their thoughts and allowing me to see their thought process. They will also be completing a Quizizz, which is an online quizzing tool. This won’t be graded but will serve as a formative assessment and self-assessment for the students.  Finally The students will take a quiz over the first 3 sections in the book to end this lesson set. This will prove to be a summative assessment. | | |
| **Integration of Other Content Areas: (If appropriate)**  This lesson will have a strong emphasis on English and incorporating proper grammar into the reconstruction of their conditional statements, as well as the rewriting of the if-then statements into the inverse, converse, and contrapositive.   The storyboard conditional statement project has a great art side to it, where they will have a chance to express their creativity and work with a partner. | | | | | |
| **Instructional Strategies to Differentiate Whole Class Instruction:**  In order to differentiate instruction, I will have activities available for the students who understand it faster than others and vice versa. If they need more assistance there will be opportunities for me to give them individualized instruction as well as coming up with simple example problems for them to work on. If I find they are understanding it well, then I will have them come up with their own problem that they could possibly share with the class, or I will have them come up with more patterns in the sequence and see if they will be able to make predictions based on the given information. | | | | | |
| **Modifications / Accommodations / Extensions For Individual Students with Identified Needs:**  There are many ELL students in my classes, so to accommodate them I will have a presentation behind me with the instructions written down. In addition to this I will be verbally communicating with them and if written and verbal communication fails there will be time where I can work 1-on-1 with them to make sure they understand the content. The school also has an ESL teacher available as a resource to them outside of my classroom and they have their textbook available for more concentrated study. I also have a modified quiz that is less English dependent for the ELL students to take. | | | | | |
| **Technology Integration: (if appropriate)**  The technology and applications I will be using for this lesson:   * Smartboard   + This only reaches the Augmentation level of SAMR, but it something I use every class and rather than powerpoint it allows an interactive experience with the whiteboard and the kids hopefully get more engagement out of the interaction. * Kahoot   + This infamous online survey tool is hopefully reaching the Modification level of SAMR, because I’m able to distribute the results to an excel spreadsheet where I can assess the answers and modify my lesson plan accordingly. This is a form of one of my pre-assessments, and the catchy music will serve as a hook for the students as well (or fuel their nightmares). * Quizizz   + A more formal Kahoot, with a less obnoxious soundtrack. This one is going to be a homework assignment for them and it’s very similar to Kahoot except for the fact that there is no time limit which is nice and I can use it as a form of Formative assessment and a way to start class by reviewing it with them. We’re probably hitting the Augmentation or Modification level here. * Weebly (class website)   + Here the students can find their homework, past presentations as well as a calendar for this weeks events on the website. This is the modification level of SAMR, because on this website they can upload their Geogebra projects and a couple of other assignments. I have also shared this with parents so they can stay updated on their kids. * Plickers   + This is a formative assessment tool that I can use to check with students anonymously and see what they knew. I have also used this as a pre-assessment. Students hold up QR cards and pick an answer on a multiple-choice question. The advantages of plickers is that it engages each student, and there is no time limit on how quickly they have to answer the question. It also saves all their responses into a spreadsheet and I can choose the order of questions depending on their understanding of the material. | | | | | |
| **Materials and Resources for Lesson Plan Development**  The materials I will need for this lesson   * Laptop * Graphic Organizers (x30) * Inductive reasoning worksheets (x30) * Coloring materials   + Colored Pencils   + Markers * Storyboard Template paper (x30) * Storyboard Rubric (x3) | | | | | |
| **Teaching & Learning Sequence:**  Day 1 (90 minutes):  Go over test (10 minutes) Explain grading  Expectations  Fist to five Pre-assessment (5 minutes)  Go over 2.1 presentation (30 minutes)  Assign Homework (2 minutes)  [Graphic Organizer](https://www.eduplace.com/graphicorganizer/pdf/flow.pdf) / [Worksheet assignment](http://math.kendallhunt.com/documents/dg3/practiceyourskills/dg_pys_02.pdf) (15 minutes)  Go over Worksheet problems (10 minutes)  Begin 2.2 Presentation (15 minutes)  Talk about Website (5 minutes)  Allow rest of time for homework and questions (remaining time)  Day 2 (90 minutes):  Review & collect homework (5 minutes)  Go over Inductive reasoning WS answers (5 minutes)  Plickers pre-assessment (5 minutes)  Begin continued 2.2 presentation (15 minutes)  Converse, Inverse, Contrapositive  Biconditional Statements  Small presentation on 2.3 (5 minutes)  Give homework (2 minutes)  Begin art project (60 minutes)  Day 3 (90 minutes):  Entrance Ticket as they walk into class on the board (5 minutes)  Collect Projects (5 minutes)  Review homework [not collecting] (5 minutes)  Review entrance ticket and answer questions for quiz (5 minutes)  Quiz (25 minutes)  Presentation on 2.4 (30 minutes)  Homework assignments (10 minutes) | | | | | |
| **Content Notes:**  *Fist to Five questions:*  *-I know how to tie my shoes*  *-I know the word conjecture*  *-I’ve used inductive reasoning before*  *-I can construct perpendicular lines*  *-I’m excited for today’s lesson*  See attached files for the mathematics content notes (Smart notebook presentations) | | | | | |
| **Post-Lesson Reflection:** These lessons seemed to go very well. The content for the students was unlike any math that they had seen before, as we begin our descent into proofs and how to write them. This lesson though was to create the foundation and building blocks of formal proofs (next lesson we’ll go more in depth on how to do them). I was pleased with how my pre-assessments went, with Plickers and fist-to-five. The kids are responding really well to them and it’s giving my great insight on the pace on which I should teach my lesson.   As for areas of improvement, I would like to be a little more flexible. I have two students in this section who are ESL students and require a lot of extra attention. I did modify a quiz for them, so they ended up taking a completely different quiz than every one else but it assessed them on the same material. Since proof writing can be very English focused, this is a tough chapter for them and accommodating them is one of my greatest challenges. They have come to see me during study halls to receive extra help though which is nice and I have been in contact with their ESL instructor.   Overall this lesson went well and the ended with a nice Summative quiz over the first few sections. Most of the students I was pleased with their score and I will be curious to see how they handle the formal proof writing that is expected of them in the upcoming chapters. | | | | | |