

COURSE: Middle School

UNIT: Medical Technologies Level 3

EXERCISE: Smooth Operator

TIME FRAME: 2-3 hours



PREPARATION: *Summary of “to do’s” that the teacher should understand and prepare before bringing this lesson to the classroom.*

Teachers will need to ensure that the proper supplies are available for students to build their solutions.

Materials:

- Tongue depressors
- Spoons
- Twine
- Paper clips
- Rubber bands
- Clothespins
- Binder clips
- Dominoes

Tools:

- Tape

Resources:

- Design folio sheets



SAFETY: *Summary of safety strategies in the lesson.*

Please use this space to describe safety procedures or highlights for this lesson.

S1

DESIRED RESULTS:

ESTABLISHED GOALS:

TRANSFER:

Students will be able to independently use their learning to ...

- Understand and appreciate the complexity of surgical tools and operations

MEANING:

UNDERSTANDINGS

Students will understand that...

- There have been many advances in modern medicine that includes rehabilitation, vaccines and pharmaceuticals, medical and surgical procedures, genetic engineering, and the systems in which health is protected and maintained

ESSENTIAL QUESTIONS

Students will keep considering...

- How a doctor can improve the effectiveness of their operations
- How they could practice surgical procedures
- The effectiveness of computer simulations for surgical practice

ACQUISITION OF KNOWLEDGE AND SKILL:

Students will know...

- How to communicate their design process and results
- The constraints of the human body and what happens when these constraints are exceeded

Students will be skilled at...

- Designing and constructing a surgical instrument
- Testing and refining various designs like those in
- Performing complex surgical operations and procedures



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S2 EVIDENCE:

EVALUATIVE CRITERIA:

- Graded rubric
-
- Thoughtful, clear, thorough
 - Graded on accuracy, multiple choice questions
 - Completed on time

ASSESSMENT EVIDENCE:

Performance Task(s):

Smooth Operator

In this activity, you will develop a surgical instrument from everyday materials to pick up a variety of objects in a surgical procedure

Other Evidence:

- Online end of unit test

S3 LEARNING PLAN: *Summary of Key Learning Events and Instruction*

Pre-Assessment:

Medical Technologies Design Pre-Test

Outline:

1. Introduce activity
2. Set students to work on designs
 - 1.1 Individually
 - 1.2 In groups of 4
3. Place three small differently shaped objects in a shoebox sized box, as well as setting up dominoes lengthwise so as to make obstacles for the students to navigate around.
4. Have groups present their plans to the class
5. Provide materials to the groups
6. Allow free testing of their ideas in the box
7. Have students answer reflection questions
8. Have students present to the class the aspects of their project they liked and didn't like

Learning Experiences:

1. A large number of your students probably haven't ever considered the amount of thought and redesign that has been done on surgical instruments. In this learning activity they will learn things that may seem completely mundane, like a dentist's plaque scraper, have gone through numerous iterations to be the efficient, if not scary and painful, tools they are today.
2. Like other group design projects, a lot of emphasis should be placed on good teamwork and communication. Try to make sure nobody is completely slacking off or dominating the project and preventing team members from contributing.
3. Redesigning and revising is another important aspect of this activity. Encourage early and often failure, and ask that the students frequently question their own design.
4. When the students are communicating their ideas to the class, there won't be enough information to present with more than one or two people. However, since there are two presentation steps, make sure the same person isn't talking at both times, it's important for everyone to practice their technical public speaking skills.

Progress Monitoring:

Teacher observes students and provides on-going feedback during the activity. While introducing the unit, the teacher will pause and ask for questions to make sure everyone understands.

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Students will complete self-assessment and brainstorm how they could improve their skills in the future. At the end of the unit, there will be a quiz to measure their overall understanding.



DIFFERENTIATION: *Summary of Key Differentiation Techniques*

Please use this space to insert your differentiation techniques. Depending on the needs of students, various techniques might be needed in a classroom, therefore use the information below and experts in the area needed to design your plan for differentiation.

The ASCD Study Guide for Integrating Differentiated Instruction and Understating by Design: Connecting Content and Kids.
by Carol Ann Tomlinson, Jay McTighe

Integrating Differentiated Instruction and Understating by Design: Connecting Content and Kids.
by Carol Ann Tomlinson, Jay McTighe
ISBN-13: 978-1416602842
ISBN-10: 1416602844

Differentiating Reading Instruction
by Laura Robb.
ISBN13: 9780545022989

A Teacher's Guide to Differentiating Instruction
The Center for Comprehensive School Reform and Improvement



CAREER CONNECTIONS: *Summary of Career Opportunities Associated with this Lesson*

Please use this space to insert careers that might be connected to this lesson. This section will need continuous updating as new careers and emerging technologies change the opportunities available in the workforce.

Good sources for career connections:

Occupational Outlook Handbook
<http://www.bls.gov/ooh>

The National Career Clusters® Framework
<http://www.careertech.org/career-clusters>



KEYWORDS: *Please Insert Keywords from this Lesson with their Definitions*

Please use this space to insert keywords and their definitions

Use resources like dictionary.com to find definitions to your keywords