# *Integrated Math 2A*
## Module 10

Student Name: _____ Teacher Name: _____

As you work through the chapters in your Integrated Math 2 course, you will be encouraged to think and to make conjectures while you persevere through challenging problems and exercises. You will make errors – and that's okay! Learning and understanding occur when you make errors and push through mental roadblocks to comprehend and solve new and challenging problems.

**Text:** *Integrated Math 2,* Big Ideas, 2016

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**To ensure you are learning, you must show your work for all exercises.**
**YOU WILL <u>NOT EARN CREDIT</u> FOR ANSWERS <u>WITHOUT WORK</u>.**

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**Chapter 11: Circumference, Area, and Volume (11.1-11.7)**
_____ Maintaining Mathematical Proficiency (page 637): Complete exercises #1-7 **all**
_____ 11.1 Circumference and Arc Length: Read the lesson and complete exercises
          #1-8 **all**, 11, 13, 15, 25, 26
_____ 11.2 Areas of Circles and Sectors: Read the lesson and complete exercises
          #3, 4, 5, 7, 11, 12, 13, 19, 21, 23, 46, 47, 48, 49
_____ 11.3 Areas of Polygons: Read the lesson and complete exercises
          #1, 3, 4, 5, 7-12 **all**, 14, 15, 16, 18, 19, 20, 25, 39
_____ 11.4 Volumes of Prisms and Cylinders: Read the lesson and complete exercises
          #1, 3-7 **all**, 9, 11, 12, 15, 17, 21, 23, 24, 45
_____ 11.5 Volume of Pyramids: Read the lesson and complete exercises
          #1-6 all, 9, 11, 12, 15, 17, 26, 27
_____ 11.6 Surface Areas and Volumes of Cones: Read the lesson and complete exercises
          #1, 3, 4, 6, 7, 8, 11, 13, 15, 27, 28, 30
_____ 11.7 Surface Areas and Volume of Spheres: Read the lesson and complete exercise
          #3, 4, 7, 8, 13, 14, 17, 21, 35

*Students must complete the Chapter Review and Project with a teacher or tutor at school.*

_____ Chapter Review (pages 694-698): Complete exercises #1-34 **all**
_____ Complete the attached Project **(No project = No credit)**

**A teacher or tutor reviewed the Chapter Review and Project with the student.**

Date: _____ Signature: _____

*Grade*

**Integrated Math 2 Project**
**Module 10: Circumference, Area and Volume**
**Textbook Pages 637-700**


**Packaging Design Project**
Before you begin, watch the following You Tube video to learn a little bit about the profession of packaging design.

Search for: *You Tube Packaging Design by Mister Rolls*
www.youtube.com/watch?v=E3RlwaMhfD4


**INTRODUCTION:**
Imagine that you are a packaging designer, and Tarbucks, a company that sells a variety of coffee and teas, has hired you to redesign their packaging. The marketing department wants to explore some new packaging designs that will catch the eye of customers. They want you to come up with two 3-dimensional prototypes (*full-sized functional models*) for a package for either coffee or tea. One design should be some kind of box (rectangular prism), and the other can be any other shape you think would work. There are two stipulations (*specific demands*). First, the package has to fit on a 12" high shelf. Second, the new packages have to hold a similar volume of coffee or tea to the original package.


**PART ONE: ORIGINAL PACKAGING**

The original package is a 3"X 4"X 8" box (rectangular prism).
Make a sketch of the original packaging and label the dimensions in your sketch. Compute the surface area and volume of the original packaging. SHOW YOUR WORK!


Surface area of original packaging _____


Volume of original packaging _____

**PART TWO: CONSTRUCT YOUR PROTOTYPES**
To make your prototypes, you will need construction paper, tape, markers, scissors, a pencil, a ruler, and maybe a compass if you decide to create a cylinder. Be creative! Use the computer to reference interesting packaging designs. And keep in mind that you need two *different* shapes, one of which is a box. They cannot be taller than 12", and the volume of each should be as close as possible to the volume of the original package.

**DESIGN A – Use the space below to sketch your idea. Label the sketch with the dimensions of the prototype:**

Dimensions _____

Use this space to calculate the surface area and volume of your design.

Surface Area _____

Volume _____

How close is the volume to that of the original package?

_____

Will this design use more or less packaging material than the original?  Explain your answer in terms of surface area.

_____

_____

**DESIGN B – Use the space below to sketch your idea. Label the sketch with the dimensions of the prototype:**

Dimensions _____

Use this space to calculate the surface area and volume of your design.

Surface Area _____

Volume _____

How close is the volume to that of the original package?

_____

Will this design use more or less packaging material than the original?  Explain your answer in terms of surface area.

_____

_____


**PART THREE: SELL YOUR DESIGNS**

Now that you have two great prototypes for coffee or tea packages, you have to present them to a team from the Tarbucks Company. Think of all the reasons your designs are better than the original so you will be ready to sell your ideas in the meeting.


What are the advantages of your Design A and why would the company want to use it as the new packaging?

_____

_____

_____

_____

_____


What are the advantages of your Design B and why would the company want to use it as the new packaging?

_____

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_____

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