Friday, March 5, 2010 – 100 min
Geometry – 10th grade - Poluan

Topics/Learning Goals:
CA Standard 8.0 – Students know, derive, and solve problems involving perimeter, area, and surface area of common geometric figures.
CA Standard 9.0 – Students compute the surface areas of prisms and pyramids; and students commit to memory the formulas for prisms and pyramids.
CA Standard 10.0 – Students compute area of polygons, including rectangles and equilateral triangles.

Lesson Goals:
- To engage ourselves in learning how to think and solve problems accurately and critically.
- To speak, read, and write the language of Mathematics precisely.
- To work efficiently and effectively in a group setting.
- To communicate ideas with and to listen to each other

Vocabulary: Prism, Pyramid, Hexagon, Pentagon, Surface Area, Net, Solid, Tetrahedron, Octahedron

What? Investigate and analyze thirteen (13) solids in two different stations
Why? To visualize and derive the surface area of prisms and pyramids
How? Creating & undoing the solids; Net Drawing and Surface Area Sheet; Group-Assessment; T-Chart; Venn Diagram; Individual Take-Out Quiz

Activities:

Task/Time	What teacher is doing	What students are doing
Explanation of Task *(5 min)*	Explaining the Task	Listening to the explanation and asking questions if the explanation is unclear.
Surface-Area and Net TASK *(35 minutes)*	Assisting students and asking deeper Math Questions	Working with each other to investigate the solids. Creating and undoing the solids in order to create the net drawing. Calculating the surface area of the solids. Deciding the most effective and efficient way of completing the task
Break – Switch Groups *(5 min)*	Sharing the analysis of the group-work to the class	Cleaning up the station and getting ready to move to the next station. Checking answers with team members.
Surface-Area and Net TASK *(25 minutes)*	Assisting students and asking deeper Math Questions	Working with each other to investigate the solids. Revising the way of working to improve efficiency. Integrating information from the previous task to solve the problem from this task. Explaining and justifying the process and solution to each other.
Break – Clean-up time *(5 min)*	Sharing the analysis of the group-work to the class	Cleaning up the station and getting ready to move back to original seats. Checking answers with team members.
Analysis of Investigation *(15 minutes)*	Answering students' questions and	Recorder/Reporter is transferring data unto group-product Resource Manager is assessing group-work and working with the Task Manager and Facilitator in completing the Venn Diagrams and T-Chart.
Take-Out Quiz *(5 minutes)*	Collecting Group-Work and Cleaning up the solids	Answering the 3-questions Take Out Quiz (which includes self-assessment)

Homework: ***HW#31 and HW#32***

TASK CARD

Objective:

Your team is going to investigate and analyze ***thirteen*** (13) solids in two stations by creating them and undoing them so that you can visualize and find the surface area.

What needs to be included in your group product:

Net Drawing & Surface Area of each solid, Venn Diagram, T-Chart Analysis, Group Assessment

The Rules:

1. Your group will be working in each station for 30 minutes. So, be mindful of the time. You may also want to think about dividing up the work.
2. To find the surface area, use the dimension of the rectangle as 3 units by 4.423 units.
3. Recorder/Reporter is the only one who is allowed to write on the Group Product ***(blue paper)***
4. Task Manager is the only one who is allowed to write on the T-Chart ***(pink paper)***
5. Facilitator is the only one who is allowed to write on the Venn Diagram ***(yellow paper)***
6. Resource Manager is the one who is allowed to write on the Group Assessment ***(green paper)***

How you will be graded:

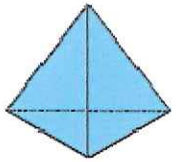
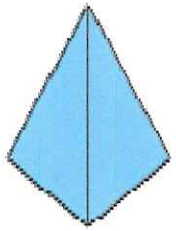
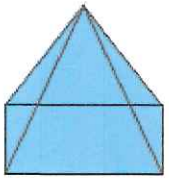
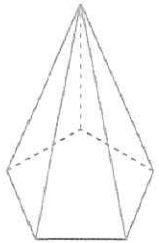
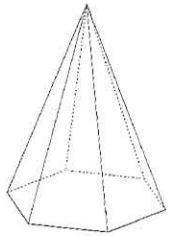
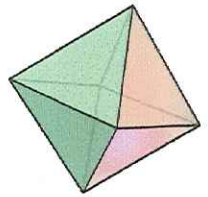
1. Group Self-Assessment (based on Work Habit, Productivity, Group Work, Performance, and how well you follow the Rules and Norms) and Ms. Poluan's Assessment.
2. Group Product (based on Completion and Accuracy)
3. Group Analysis –T-Chart and Venn Diagram (based on Content)
4. Individual Product (based on the 3-Question Take-Out Quiz at the end of class)

Norms:

1. Explain your thinking
2. Ask Questions

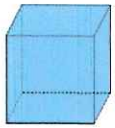
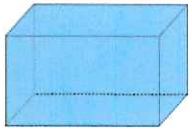
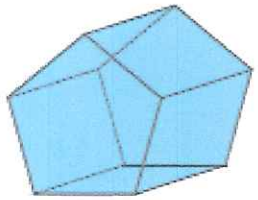
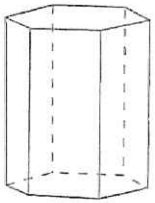
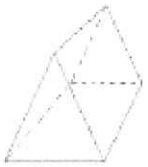
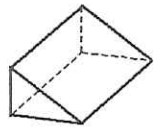
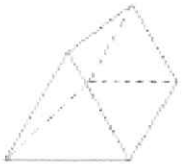
Facilitator:	Make sure NO ONE gets left behind *"Do we all agree? Are we all on this problem?"*
Task Manager:	Make sure NO ONE sits back or talks to another group *"Let's get back on task."*
Recorder/Reporter:	Make sure EVERYONE understands what to do *"Does that make sense? What do you think?"*
Resource Manager:	Make sure EVERYONE has the materials, and that all team questions go through you *"No one has an idea? Should I call the teacher?"*

Pyramids

	Tetrahedron (equilateral triangles)	Triangular Pyramid	Square-based Pyramid	Pentagonal Pyramid	Hexagonal Pyramid	Octahedron
3-D Picture						
Number of Faces						
Type of Faces					1 Hexagon 6 Isosceles Triangles	
Net Drawing						
Surface Area						

(Suppose that the dimension of the rectangle is 3 units by 4.243 units)

Prisms

	Cube	Rectangular Prism (a.k.a Cuboid)	Pentagonal Prism	Hexagonal Prism	(Isosceles) Triangular Prism	(Isosceles Right) Triangular Prism	(Equilateral) Triangular Prism
3-D Picture							
Number of Faces							
Type of Faces					1 Square 2 Rectangles 2 Isosceles Triangles		
Net Drawing							
Surface Area							

(Suppose the dimension of the rectangle is 4 units by 5.657 units)

GROUP #_____ PERIOD ____ GROUP PRODUCT

Recorder/Reporter is the only one who can write on this paper

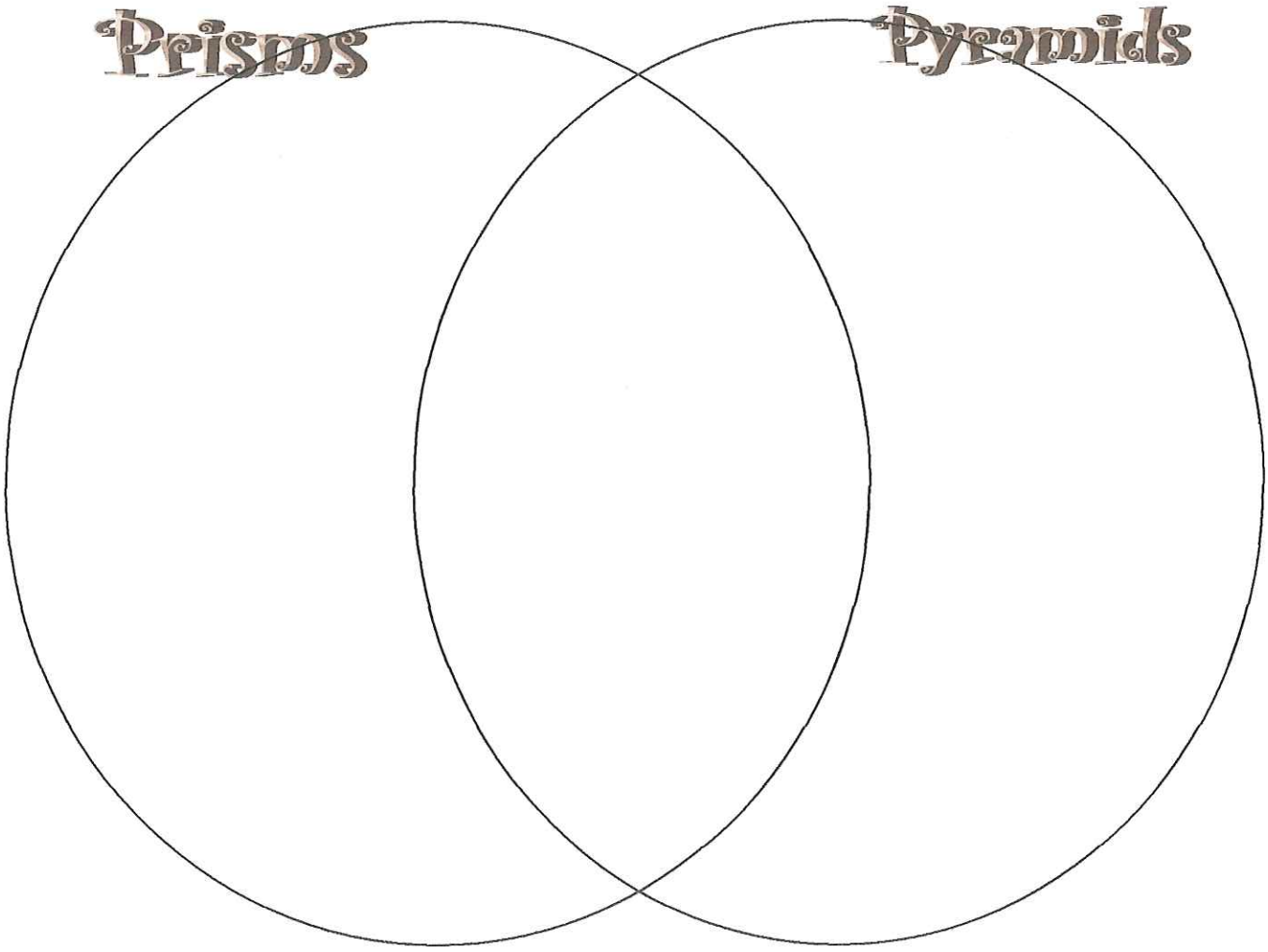
Please include the net drawing and the surface area of each solid

#	Type of Solid	Net Drawing	Surface Area
1	Cube		
2	Rectangular Prism (Cuboid)		
3	Pentagonal Prism		
4	Hexagonal Prism		
5	(Isosceles) Triangular Prism		
6	(Isosceles Right) Triangular Prism		
7	(Equilateral) Triangular Prism		
8	Tetrahedron (Equilateral Triangles)		
9	Triangular Pyramid		
10	Square-based Pyramid		
11	Pentagonal Pyramid		
12	Hexagonal Pyramid		
13	Octahedron		

GROUP #_____ PERIOD ____ VENN DIAGRAM ANALYSIS

Facilitator is the only one who can write on this paper

List the similarities and differences that you see between the prisms and pyramids



GROUP #_____ PERIOD _____ T-CHART ANALYSIS

Task Manager is the only one who can write on this paper

List everything that you have noticed from both the prisms and the pyramids

Prisms	Pyramids

GROUP #_____ PERIOD ____ GROUP SELF-ASSESSMENT

Resource Manager is the only one who can write on this paper

When you are finished, please assess your effort and performance as a group.

	Below Standard	Meeting Standard	Above Standard
Work Habit	We did not start working until our teacher reminded us to do so.	We went to work within the first five minutes after the instruction.	We went to work immediately after the instruction.
Productivity	We were on-task half of the time and we chatted with another group despite a reminder from our teacher.	We were on-task more than half of the time. We chatted with another group maybe once.	We continuously stayed on-task and did not chat with another group.
Group Work	We worked individually. We did not talk to each other very much. We did our own thing. Not everybody contributed to the work.	We talked to each other most of the time, but we still did our own thing. We asked each other questions and no one was left behind.	We always explained the concept to each other. No one was left behind. Everybody in the group understood agreed on the decision we made.
Performance	We did not explain how we solved the problem. We did not use pictures to show you how we solved the problem.	We clearly explained how we solved the problem. We used math language and pictures to explain how we solved the problem.	We thought of more than one way to solve the problem, but we chose only one. We clearly detailed how we solved the problem and we used pictures to explain what we did.
Rules and Norms	We did not follow the rules at all. We did not ask any question or explain our thinking to each other	We followed the rules. We asked questions but we rarely explained our thinking to each other.	We definitely followed the rules. We asked questions to each other all the time and we always explained our thinking.

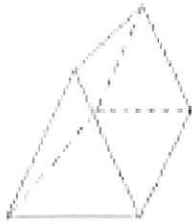
What was one thing your group learned from this task?

In the future, what would your group do differently?

GROUP #_____ Name _____ Individual Product

1.) Describe what you and your group did today.

2.) Describe how you would find the surface area of the figure below:



3.) Self-Assessment

	Below Standard	Meeting Standard	Above Standard
Understanding	I had no idea what we did today	I can tell you exactly what we did today and I can even tell someone at home about it.	I can tell you exactly what we did today and I can draw a net drawing of ANY 3-D solid you give me.
Strategies, Reasoning, Procedures	I am stuck. I'm not sure my answer is right. I could use some help.	I have a correct solution. I used a plan to solve the problem	My solution is effective and inventive. I used big math ideas to solve the problem. I addressed the *important details.*
Communication	I explained some of what I did. I tried to use pictures, tables, graphs, and numbers to explain how I did the problem.	I clearly explained how I solved the problem. I used math language and pictures, tables, graphs, and numbers to explain how I did the problem	I clearly detailed how I solved the problem. I included all the steps so you don't have to guess what I did. I used words, numbers, pictures, graphs and/or models.

GROUP #__ - Name: _____ - Ms. Poluan's Assessment

1.) Group Assessment (How well your group worked together)

2.) Group Product (How accurate is your net diagram and the surface area you've found)

3.) Group Analysis T-Chart (How much can you describe about prisms and pyramids)

4.) Group Analysis Venn Diagram (How many similarities and differences your group found)

5.) Individual Product (What you've learned from the 100-minute lesson)

	Below Standard	Meeting Standard	Above Standard
Understanding	I had no idea what we did today	I can tell you exactly what we did today and I can even tell someone at home about it.	I can tell you exactly what we did today and I can draw a net drawing of ANY 3-D solid you give me.
Strategies, Reasoning, Procedures	I am stuck. I'm not sure my answer is right. I could use some help.	I have a correct solution. I used a plan to solve the problem	My solution is effective and inventive. I used big math ideas to solve the problem. I addressed the important details.
Communication	I explained some of what I did. I tried to use pictures, tables, graphs, and numbers to explain how I did the problem.	I clearly explained how I solved the problem. I used math language and pictures, tables, graphs, and numbers to explain how I did the problem	I clearly detailed how I solved the problem. I included all the steps so you don't have to guess what I did. I used words, numbers, pictures, graphs and/or models.

Grade Received for the Task: _____