**Find the Percentage and Angle of Each Subject**

**Alignment to Content Standards**

**CCSS.Math.Content.HSA.SSE.B.3**

Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

**Task**

A survey of 10th grade students was given to determine what their favorite subject is. Use the first graph and find the percentage of students that chose the subject as their favorite. Round the nearest hundredth. (.344=34% or .345=35%). Use that information, with previous knowledge about a circle, and find the central angle that each percent represents in the pie chart.

* Use this pie chart to label percentages and angles of each piece. (Hint: the pie graph is 360°).
* After finding the percentage and the angle of each subject, write it as a single proportion and solve for the measure of the central angle. The answer should be in degrees.

**Commentary**

The students will be able to determine the percentages of the student’s favorite subject. They will then be able to use those percentages to find the angles of each piece of the pie graph. They are going to work in groups of 3 or pairs while working through this lesson. While using the first chart, the students will use the number of students that chose each subject to determine a percentage. They will have to find the total number of students in the survey first. This will require them to make an equation of n students divided by the total (n/147=p). After they find the percentage of each subject, they will have to relate it to each piece of the pie chart with an angle. They should be able to relate that a circle is 360° and each piece of the pie chart will represent an angle. This will require them to make another equation where they use their percentages (p) and multiply it by 360 to find the angle of each pie piece (p\*360=a). When they write it as a proportion they will use the information they originally obtained to help them find the central angle with one equation,

**Solution**

* P.E.- (Percentage) 9/147=0.0612≈ 6%⇒(Angle)
* Eng./Lit.- 25/147=0.17≈ 17%⇒(Angle)
* Math- 29/147=0.1973≈20%⇒(Angle)
* Tech./Shop- 12/147=0.08163≈8%⇒(Angle)
* Art/Music- 7/147=0.0476≈5%⇒(Angle)
* Science- 32/147=0.2177≈22%⇒(Angle)
* History- 22/147=0.1497≈15%⇒(Angle)
* Other- 11/147=0.0748≈7%⇒(Angle)

This is how the students should write the equation as a proportion and solve for the central angle in one equation. There will be some difference in the angle since rounding was necessary for figuring it in the first part.

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* P.E.- n=9,
* Eng./Lit.- n=25,
* Math- n=29,
* Tech./Shop- n=12,
* Art/Music- n=7,
* Science- n=32,
* History- n=22,
* Other- n=11,

Each piece of the pie chart is represented by a percentage of total students who chose the given subject as their favorite. Each piece is also represented by central angle of the total pie chart.