**S**



|  |  |
| --- | --- |
|  |  2019-2020 AP Statistics Guide  |

<http://secondarymath.dmschools.org>

<http://grading.dmschools.org>

<http://dmschools.org>

Geometry: Year at a Glance 2019-2020

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Semester One Topics | **Topic 1: Exploring One-Variable Data** | **Topic 2: Exploring Two-Variable Data** | **Topic 3: Collecting Data** | **Topic 4: Probability, Random Variables, and Probability Distributions** |
| Approximate PacingUsing 45min sessions | **~14-16**  | **~10-11** | **~9-10** | **~18-20** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Semester Two Topics | **Topic 5: Sampling Distributions** | **Topic 6: Inference for Categorical Data: Proportions** | **Topic 7: Inference for Quantitative Data: Means** | **Topic 8: Inference for Categorical Data: Chi-Square** | **Topic 9: Inference for Quantitative Data: Slopes** |
| Approximate Pacing Using 45min sessions | **~10-12** | **~16-18** | **~14 - 16** | **~ 10-11** | **~ 7-8** |

**Standards-Referenced Grading Basics**

**Our purpose in collecting a body of evidence is to:**

|  |  |
| --- | --- |
| **Evidence shows the student can...** | **Topic Score** |
| Demonstrate all learning targets from Level 3 and Level 4 | 4.0 |
| Demonstrate all learning targets from Level 3 with partial success at Level 4 | 3.5 |
| Demonstrate all learning targets from Level 3 | 3.0 |
| Demonstrate at least half of the Level 3 learning targets | 2.5 |
| Demonstrate all learning targets from Level 2 but fewer than half of the learning targets from Level 3 | 2.0 |
| Demonstrate at least half of the Level 2 learning targets and none of the Level 3 learning targets | 1.5 |
| Demonstrate fewer than half of the learning targets from Level 2 and none of the Level 3 learning targets | 1.0 |
| Produce no evidence appropriate to the learning targets at any level | 0 |

• Allow teachers to determine a defensible and credible topic score based on a representation of student learning over time.

• Clearly communicate where a student’s learning is based on a topic scale to inform instructional decisions and push student growth.

• Show student learning of Level 3 targets through multiple and varying points of data

• Provide opportunities for feedback between student and teacher.

**Scoring**

A collaborative scoring process is encouraged to align expectations of the scale to artifacts collected. Routine use of a collaborative planning and scoring protocol results in calibration and a collective understanding of evidence of mastery. Enough evidence should be collected to accurately represent a progression of student learning as measured by the topic scale. Teachers look at all available evidence to determine a topic score. All topic scores should be defensible and credible through a body of evidence.

**Guiding Practices of**

**Standards-Referenced Grading**

**1.** A consistent 4-point grading scale will be used.

**2.** Student achievement and behavior will be reported separately.

**3.** Scores will be based on a body of evidence.

**4.** Achievement will be organized by learning topic and converted to a grade at semester’s end.

**5.** Students will have multiple opportunities to demonstrate proficiency.

**6.** Accommodations and modifications will be provided for exceptional learners.

**\*\*\*Only scores of 4, 3.5, 3, 2.5, 2, 1.5, 1, and 0 can be entered as Topic Scores**.

**Multiple Opportunities**

Philosophically, there are two forms of multiple opportunities, both of which require backwards design and intentional planning. One form is opportunities planned by the teacher throughout the unit of study and/or throughout the semester. The other form is reassessment of learning which happens after completing assessment of learning at the end of a unit or chunk of learning (see information in [SRG Handbook](http://gradingsecondary.dmschools.org/uploads/1/3/2/2/13224522/2018-19_dmps_srg_handbook_for_printing_forrest_yes_asof_4-9-19.pdf))

Students will be allowed multiple opportunities to demonstrate proficiency. Teachers need reliable pieces of evidence to be confident students have a good grasp of the learning topics before deciding a final topic score. To make standards-referenced grading work, the idea of “multiple opportunities” is emphasized. If after these opportunities students still have not mastered Level 3, they may then be afforded the chance to reassess.

|  |
| --- |
| Topic 1: Exploring One-Variable Data  |
|  |
|

|  |  |  |  |
| --- | --- | --- | --- |
| **Standard(s)** | **Exceeding Target (ET – 4)**  | **Learning Goal (AT – 3)** | **Progressing (PT – 2)** |
|  | The student demonstrates in-depth inferences and applications that go beyond the learning goal. **Possible Task:** \*A level four task should include the following: prior learning; cognitive complexity; integrated skills; real world relevance; authentic application beyond the classroom. | **3A: Interpret and compare categorical displays of data. (Quantitative and Categorical)****3B: Interpret and compare quantitative displays of data, by applying SOCS and using the appropriate measure of center and spread.** **(Quantitative and Categorical)****3C: Interpret the meaning of the area under the normal curve.****3D: Solve for values using the area under the normal curve.** **3E: Comparing two sets of data by normalizing data.** | *Identify the essential pieces of foundational knowledge students need in order to show that they are PROGRESSING toward the grade level expectation.***PLC agreed-upon foundational skills for 3A/B:** * *Construct graphical displays with data or computer outputs*
* *Shapes*
* *Center*
* *Spread*
* *Outliers*

**PLC agreed-upon foundational skills for 3C/D/E:** * *Find area under the normal distribution*
	+ *Using z-scores*
	+ *Using 68-95-99.7 Rule*
 |

 |

|  |
| --- |
| Topic 2: Exploring Two-Variable Data |
|  |
|

|  |  |  |  |
| --- | --- | --- | --- |
| **Standard(s)** | **Exceeding Target (ET – 4)**  | **Learning Goal (AT – 3)** | **Progressing (PT – 2)** |
| **G-CO.C****Prove geometric theorems** | The student demonstrates in-depth inferences and applications that go beyond the learning goal. **Possible Task:** \*A level four task should include the following: prior learning; cognitive complexity; integrated skills; real world relevance; authentic application beyond the classroom. | **3A: Interpret the slope and y-intercept of a least squares regression line in context.** **3B: Interpret residual/residual plot of a least squares regression line in context.** **3C: Interpret correlation of a least squares regression line.****3D: Interpret** $r^{2}$ **in context of the problem.** | *Identify the essential pieces of foundational knowledge students need in order to show that they are PROGRESSING toward the grade level expectation.***PLC agreed-upon foundational skills for all:** * *Construct and interpret a scatterplot*

**PLC agreed-upon foundational skills for 3A:*** *Find the slope and y-intercept of the least squares regression line.*
* *Calculate regression lines*
	+ *Using standard deviations and means*
	+ *Using computer outputs*

**PLC agreed-upon foundational skills for 3B:*** *Find the residual of a least squares regression line.*

**PLC agreed-upon foundational skills for 3C:*** *Find the correlation, r, of the least squares regression line.*

**PLC agreed-upon foundational skills for 3D:*** *Find* $r^{2}$ *of a least squares regression line*
 |

 |

|  |
| --- |
| Topic 3: Collecting Data |
|  |
|

|  |  |  |  |
| --- | --- | --- | --- |
| **Standard(s)** | **Exceeding Target (ET – 4)**  | **Learning Goal (AT – 3)** | **Progressing (PT – 2)** |
|  | The student demonstrates in-depth inferences and applications that go beyond the learning goal. **Possible Task:** \*A level four task should include the following: prior learning; cognitive complexity; integrated skills; real world relevance; authentic application beyond the classroom. | **3A – Design a sampling method for a random sample for a given scenario.****3B – Explain why a sampling method is or is not appropriate for a given situation.****3C – Create an experimental design that is appropriate for the given scenario.****3D – Compare experimental designs and methods.** | *Identify the essential pieces of foundational knowledge students need in order to show that they are PROGRESSING toward the grade level expectation.***PLC agreed-upon foundational skills for 3A/B:** * *Identify type of sampling in a given scenario.*
* *Use table D to create a random sample.*
* *Identify type of bias in a given scenario.*

**PLC agreed-upon foundational skills for 3C/D:** * *Identify types of experimental design in a given scenario.*
* *Distinguish between an observational study and an experiment.*
* *Identify the experimental units (subjects), explanatory variables (factors), treatments, and response variables in an experiment.*
* *Describe elements of a well designed experiment.*
 |

 |

|  |
| --- |
| Topic 4: Probability and Probability Distributions |
|  |
|

|  |  |  |  |
| --- | --- | --- | --- |
| **Standard(s)** | **Exceeding Target (ET – 4)**  | **Learning Goal (AT – 3)** | **Progressing (PT – 2)** |
|  | The student demonstrates in-depth inferences and applications that go beyond the learning goal. **Possible Task:** \*A level four task should include the following: prior learning; cognitive complexity; integrated skills; real world relevance; authentic application beyond the classroom. | **3A – Determine relative frequencies, proportions, or probabilities using simulation or calculations*** **Unions**
* **Intersections**
* **Conditional**
* **Independent Events**

**3B – Interpret a probability distribution*** **Shape**
* **Center**
* **Spread**

**3C – Describe the effects of linear transformations of parameters of random variables****3D – Interpret probabilities and parameters for a binomial/geometric distributions** | *Identify the essential pieces of foundational knowledge students need in order to show that they are PROGRESSING toward the grade level expectation.***PLC agreed-upon foundational skills for 3A:** * *Use general addition rule and multiplication rule to generate probabilities.*
* *Find the probability that an event occurs using a two-way table.*

**PLC agreed-upon foundational skills for 3B:** * *Create appropriate displays of distributions*
* *Calculate the mean and standard deviation of a random variable*

**PLC agreed-upon foundational skills for 3C:** * *Calculate parameters for linear combinations of random variables*

**PLC agreed-upon foundational skills for 3D:** * *Check conditions for binomial/geometric distribution*
* *Calculate parameters for a binomial/geometric distribution*
 |

 |

|  |
| --- |
| Topic 5: Sampling Distributions |
|  |
|

|  |  |  |  |
| --- | --- | --- | --- |
| **Standard(s)** | **Exceeding Target (ET – 4)**  | **Learning Goal (AT – 3)** | **Progressing (PT – 2)** |
|  | The student demonstrates in-depth inferences and applications that go beyond the learning goal. **Possible Task:** \*A level four task should include the following: prior learning; cognitive complexity; integrated skills; real world relevance; authentic application beyond the classroom. | **3A – Interpret probabilities and parameters for a sampling distribution for a sample proportion.****3B – Interpret probabilities and parameters for a sampling distribution for a difference in proportions.****3C - Interpret probabilities and parameters for a sampling distribution for a sample mean.****3B – Interpret probabilities and parameters for a sampling distribution for a difference in means.** | *Identify the essential pieces of foundational knowledge students need in order to show that they are PROGRESSING toward the grade level expectation.***PLC agreed-upon foundational skills for 3A/3C:** * *Determine parameters of a sampling distribution for sample proportions/means.*
* *Determine whether a sampling distribution for a sample proportion/mean can be described as approximately normal.*

**PLC agreed-upon foundational skills for 3B/D:** * *Determine parameters of a sampling distribution for a difference in sample proportions/means.*
* *Determine whether a sampling distribution for a difference of sample proportions/means can be described as approximately normal.*
 |

 |

|  |
| --- |
| Topic 6: Inference for Categorical Data: Proportions |
|  |
|

|  |  |  |  |
| --- | --- | --- | --- |
| **Standard(s)** | **Exceeding Target (ET – 4)**  | **Learning Goal (AT – 3)** | **Progressing (PT – 2)** |
|  | The student demonstrates in-depth inferences and applications that go beyond the learning goal. **Possible Task:** \*A level four task should include the following: prior learning; cognitive complexity; integrated skills; real world relevance; authentic application beyond the classroom. | **3A – Justify a claim based on a confidence interval for a population proportion.****3B – Justify a claim based on confidence interval for a difference of proportions.****3C – Justify a claim about the population based on the results of a significance test for a population proportion.****3D – Justify a claim about the population based on the results of a significance test for a difference of population proportions.****3E – Interpret Type I and Type II errors.** | *Identify the essential pieces of foundational knowledge students need in order to show that they are PROGRESSING toward the grade level expectation.***PLC agreed-upon foundational skills for all:** * *State: Appropriate Test*
* *Plan: Check conditions*
* *Do: Perform appropriate calculations*
 |

 |

|  |
| --- |
| Topic 7: Inference for Quantitative Data: Means |
|  |
|

|  |  |  |  |
| --- | --- | --- | --- |
| **Standard(s)** | **Exceeding Target (ET – 4)**  | **Learning Goal (AT – 3)** | **Progressing (PT – 2)** |
|  | The student demonstrates in-depth inferences and applications that go beyond the learning goal. **Possible Task:** \*A level four task should include the following: prior learning; cognitive complexity; integrated skills; real world relevance; authentic application beyond the classroom. | **3A – Justify a claim based on a confidence interval for a population means.****3B – Justify a claim based on confidence interval for a difference of means.****3C – Justify a claim about the population based on the results of a significance test for a population means.****3D – Justify a claim about the population based on the results of a significance test for a difference of population means.****3E – Interpret Type I and Type II errors.** | *Identify the essential pieces of foundational knowledge students need in order to show that they are PROGRESSING toward the grade level expectation.***PLC agreed-upon foundational skills for all:** * *State: Appropriate Test*
* *Plan: Check conditions*
* *Do: Perform appropriate calculations*
 |

 |
|  |

|  |
| --- |
| Topic 8: Inference for Categorical Data: Chi-Square |
|  |
|

|  |  |  |  |
| --- | --- | --- | --- |
| **Standard(s)** | **Exceeding Target (ET – 4)**  | **Learning Goal (AT – 3)** | **Progressing (PT – 2)** |
|  | The student demonstrates in-depth inferences and applications that go beyond the learning goal. **Possible Task:** \*A level four task should include the following: prior learning; cognitive complexity; integrated skills; real world relevance; authentic application beyond the classroom. | **3A – Justify a claim about the population based on the results of a chi-square test for goodness of fit.****3B – Justify a claim about the population based on the results of a chi-square test for homogeneity or independence.** | *Identify the essential pieces of foundational knowledge students need in order to show that they are PROGRESSING toward the grade level expectation.***PLC agreed-upon foundational skills for 3A:** * *See pages 183-186 of AP Curriculum Framework*

**PLC agreed-upon foundational skills for 3A:** * *See pages 187-191 of AP Curriculum Framework*
 |

 |
|  |

|  |
| --- |
| Topic 9: Inference for Quantitative Data: Slope |
|  |
|

|  |  |  |  |
| --- | --- | --- | --- |
| **Standard(s)** | **Exceeding Target (ET – 4)**  | **Learning Goal (AT – 3)** | **Progressing (PT – 2)** |
|  | The student demonstrates in-depth inferences and applications that go beyond the learning goal. **Possible Task:** \*A level four task should include the following: prior learning; cognitive complexity; integrated skills; real world relevance; authentic application beyond the classroom. | **3A – Justify a claim based on a confidence interval for the slope of a regression model****3B – Justify a claim about the population based on the results of a significance test for the slope of a regression model.** | *Identify the essential pieces of foundational knowledge students need in order to show that they are PROGRESSING toward the grade level expectation.***PLC agreed-upon foundational skills for 3A:** * *See pages 199-201 in AP Curriculum Framework*

**PLC agreed-upon foundational skills for 3A:** * *See pages 202-205 in AP Curriculum Framework*
 |

 |