

Detailed Syllabus with Concurrent Coverage

This syllabus gives one possible listing of activities for the 30 class meetings of a course meeting twice a week for a 15 week semester. Three “free classes” are included at the end for either slack time or for teachers to add favorite activities. Six classes are reserved for examinations, three exams and three review classes (one before each exam).

The abundance of activities presented in the text enables teachers to develop a geometry course according to their personal preferences and vision. In addition, the modular nature of the text activities permits teachers to add or substitute their own favorite activities and projects. This syllabus is one possibility which we present to help new users to get started.

Explanation of Terms Used in Syllabus

Discussions: *Questions on day’s assignments:* This notation is given during the first few classes as a reminder of the class structure used by the authors when using this text. The first portion of the class (typically 30 to 50 minutes) is dedicated to responding to students questions about APs that were assigned for the day. Students are expected to try all APs in advance of class. See the document *Basic Guidelines for Course Management* on the teacher’s website (www.math.okstate.edu/geosetIR/) for more information on this format which is intended to reduce lecturing (a passive activity for students) and increase student involvement. If a different format is used for classes then this notation can be ignored.

Group ^{*ITP*} (*Early start*): The abbreviation ITP stands for “If Time Permits.” This notation indicates a possible group class activity which can be used in class depending on how rapidly questions about assigned activities are resolved. Also the activity can be used if class discussion seems to be stalling and something different is needed.

Training Activity: *Major Shifts in Teaching:* This general notation suggest that, if time allows, a very brief activity can be used to explicitly address the different roles of both teachers and students in an inquiry-based curriculum. Suggestions for appropriate activities are given in the PDF document *Training Activities: Major Shifts in Teaching* found on the teachers website www.math.okstate.edu/geosetIR/.

Launch: As a general rule, APs are designed to be done without advance comment on the part of the instructor. The “Launch” designation in the syllabus indicates those few cases where something needs to be said by the teacher in advance of assigning an AP.

TRY: This notation is used just once in the syllabus in Class #7. The activity gives printed instructions for folding snowflakes. Students are to “try” to follow the instructions, a difficult task since such diagrams are difficult to follow. In the next class we ask for a volunteer to show the class how to fold the snowflake; most students then quickly catch on. This activity provides students an opportunity to struggle with folding instructions.

(CD#, page***):** This notation suggests a Construct/Describe (CD) problem to be assigned from the appendix A3.3 *Catalogue of CD Problems* on page 654 of the text. See the document *Basic Guidelines for Course Management* on the teachers’ website (www.math.okstate.edu/geosetIR/) for more information about CD problems.

Detailed Syllabus with Concurrent Coverage

Class #1: Tuesday of week 1

Introductory remarks: Textbook, syllabus, manipulatives, etc.

Inclass activity: (AP0.1-page 5) *Folding Polygons from a Circle*. This AP provides a script for a hands-on whole class paper folding activity intended to promote participation (20-30 min).

Assignment #1:

- (AP0.1-p5) Folding Polygons from a Circle
- Read pages xvi & xvii – Major Shifts in Teaching
- (AP0.2-p9) Making Squares
- (AP0.3-p11) Two Congruent Halves
Note: May skip above AP or substitute AP0.4.
- (AP1.1-p17) Parallel Line Grid: Sum of the Angles of a Triangle

Class #2: Thursday of week 1

Discussion: Questions on day's assignments.

Introduction: Construct/Describe (CD) problems by paper folding. Allow students to figure out, helping each other, how to fold segment and angle bisectors. Emphasize the importance of the "describe" part.

Group^{ITP}: (AP2.1-p59) Checking Properties of Quadrilaterals

Assignment #2:

- (AP1.4-p23) Sum of the Angles of Any Triangle
- (AP1.5-p25) The Angles of a Polygon
- (AP2.1-p59) Checking Properties of Quadrilaterals
- Read pages 109-112 on CDs.
- (AP3.1-p113) Introduction to CDs: Two Basic Constructions

Class #3: Tuesday of week 2

Discussion: MiniProject AP1.3-p21 due in one week. Questions on day's assignments.

Training Activity: Major Shifts in Teaching

Group^{ITP} (Early start): (AP3.2-p115) CD Problem: A Parallel Line

Assignment #3:

- (AP1.8-p29) Problems: Sums and Relationships of Angles
- (AP1.9-p31) Four Kinds of Related Angles
- (AP2.2-p63) Properties of Quadrilaterals
- (AP2.3-p65) Marking Quadrilateral Properties
- (AP3.2-p115) CD Problem: A Parallel Line
- Bring compass to class next time.
- MiniProject AP1.3-p21 due in week.

Alternatives: Assign AP1.6 if the question comes up. Assign AP1.7 if literature connection is important.

Class #4: Thursday of week 2

Announce: Project (AP1.3-p21) due next class.

Discussion: Questions on day's assignments.

Training Activity: Major Shifts in Teaching

Launch: (AP3.4-p117) Fold equilateral triangle. Note: This is a difficult construction. Show how to do it.

Group^{ITP} (Early start): (AP3.6-p119) Circumscribed circle

Assignment #4:

- (AP1.10-p33) Figuring Angles and Checking by Measurement
- (AP1.11-p35) Parallel lines: How to Recognize Them
- (AP2.4-p67) Properties of Diagonals of Quadrilaterals
- (AP3.4-p117) CD: An Equilateral Triangle
- (AP3.6-p119) CD: Circumscribing circle
- Note: Mini-project (AP1.3-p21) due next time.

Class #5: Tuesday of week 3

Collect: Mini-project (AP1.3-p21), show & tell.

Announce: Quiz on Angle problems (Chap 1) next class.

Discussion: Questions on day's assignments.

Training Activity: Major Shifts in Teaching

Group^{ITP} (Early start): (AP2.5-p69) Checking Quadrilaterals by Folding

Assignment #5:

- (AP1.14a-p43) Angle Problems, Version A
- (AP1.18-p54) Possible or Not
- (AP2.5-p69) Check Quadrilaterals by Folding
- (AP3.7-p120) CD: Inscribed Circle
- (CD#12-p655) Construct and isosceles right triangle when given a leg.

Note: Do CDs on a separate sheet. See "Presentation Requirements" on page 652.

- Quiz on Chapter 1 (Angle problems) next time.

Class #6: Thursday of week 3

Discussion: Questions on day's assignments.

Training Activity: Major Shifts in Teaching

Quiz #1: Brief quiz (10 min) at end of class covering chapter 1 (angle problems).

Assignment #6:

- (AP1.13-p41) Convex: Different Ways to Make Sense of It
- (AP2.7-p75) Checking Examples Visually or Physically
- (AP2.9a-p83) Problems: Properties of Quadrilaterals, Version A
- (AP3.8-p123) CD: Balance Point of a Triangle
- (CD#13-p655) Construct a circle through three points.
- Quiz on Chapter 2 (Properties of Quadrilaterals) next time.

Class #7: Tuesday of week 4

Discussion: Questions on day's assignments.

Quiz #2: Brief quiz (10 minutes) at end of class covering Chapter 2 (Properties of Quadrilaterals).

Assignment #7:

- (AP1.19-p55) True or False (with Example)
- (CD#11-p655) Construct an isosceles right triangle when given the hypotenuse.
- (AP3.11-p127) **TRY** - Folding a Six-Pointed Star or Snowflake
- (AP5.1-p209) How Much Space in a Triangle?
- (AP5.2-p211) Areas on a Geoboard
- Bring geoboard next time.

Class #8: Thursday of week 4

Discussion: Questions on day's assignments.

Announce: CD quiz next time.

Group ^{ITP}(Early start): (AP5.8-p223) Area Problems, First Try

Assignment #8:

- (AP1.17-p53) Conjecturing about Quadrilaterals
- (AP5.8-p223) Area Problems: First Try
- (AP5.3-p213) Two Ways: Cut-Up and Take-Away
- (AP5.4-p215) Areas: Parallelograms and Trapezoids
- (AP5.5-p217) Areas by Julie's Way
- CD quiz next time.

Class #9: Tuesday of week 5

Discussion: Questions on day's assignments.

Quiz #3: Brief (12 minute) quiz consisting of a CD problem.

Assignment (Not collected since just before exam):

- (AP5.6-p219) Which Ways Work for These Figures?
- (AP5.9-p225) A Sampling of Area Problems
- (AP5.11a-p229) Area Problems, Version A

Class #10: Thursday of week 5

Review class

Class #11: Tuesday of week 6

Hour exam #1

Assignment #9:

- (7.1-273) Slope or Steepness
- (7.2-275) Slope: Parallel and Perpendicular
- (7.3-277) Slope Problems, Part 1
- (7.6-283) Similar Figures and Their Properties

Class #12: Thursday of week 6

Launch: (5 minutes) Show how to make a tetrahedron from an envelope as in AP4.1, page 137.

Group ^{ITP}(Early start): (7.8-287) Measuring Proportionality

Assignment #10:

- (4.1-137) Polyhedra from an Envelope
- (7.4-279) Slope Problems, Part 2
- (7.7-285) Similar Figures and Proportionality
- (7.8-287) Measuring Proportionality
- (8.1-319) Right Triangles of Squares

Class #13: Tuesday of week 7

Announce: Making models (4.3-143 or 4.6-155) will be due next time. Assign different groups each of the models so that complete sets are available for the next class.

Launch: (5 minutes) Give a brief demonstration of how to measure the perimeter of geoboard figures using string as illustrated in AP8.3, page 325.

Group ^{ITP}(Early start): (8.3-325) Estimating Perimeters on a Geoboard

Assignment #11:

- (7.9-289) Reasoning with Similar Triangles
- (4.3-143) or (4.6-155) (Group) Models of Polyhedra
- (8.3-325) Estimating Perimeter on a Geoboard
- (8.4-327) Slant Lengths on a Geoboard

Class #14: Thursday of week 7

Intro: Give a brief (5 minute) introduction to straightedge and compass constructions.

Group ^{ITP}(Early start): (10.1-391) Basic Straightedge and Compass Constructions

Assignment #12:

- (4.4-151) Prisms
- (7.10-291) Similarity and Scale Factors (Length Factors)
- (7.11-293) Scaling, Areas, and Area Factors
- (8.5-329) Geoboard Perimeters
- (10.1-391) Basic Straightedge and Compass Constructions

Class #15: Tuesday of week 8

Group ^{ITP}(Early start): (7.12-295) Scaling Problems, First Try

Assignment #13:

- (4.5-153) Making Sense of Volume: A Basic Relationship
- (4.7-159) Pyramids
- (7.12-295) Scaling Problems, First Try
- (10.2-393) Straightedge and Compass: Construct a Parallel Line
- (CD#13, p655) Construct (with straightedge and compass) a circle given three points.

Class #16: Thursday of week 8

Group ^{ITP}(Early start): (8.7-333) Pythagorean Problems, First Try

Assignment #14:

- (4.8-161) Edges, Faces, and Vertices of Polyhedra
- (4.11-167) Volumes of Prisms, Pyramids, and Spheres
- (7.13-297) Scaling Problems
- (8.7-333) Pythagorean Problems, First Try
- (CD#11, p655) Construct (with straightedge and compass) an isosceles right triangle given the hypotenuse.

Class #17: Tuesday of week 9

Group ^{ITP}(Early start): (4.14-175) Volume of Solids, First Try

Assignment #15:

- (4.14-175) Volume of Solids, First Try
- (7.15a-301) Problems: Slope, Similarity and Scaling, Version A
- (8.8a-335) Perimeter and Right-Triangle Problems, Version A
- (CD#22, p656) Construct (with straightedge and compass) a parallelogram given two sides and the included angle.
- (CD#27, p656) Construct (with straightedge and compass) six equally spaced points around a circle.

Class #18 Thursday of week 9

Group ^{ITP}(Early start): (4.15a-176) Solid-Geometry Problems. Alternate: Assign any AP needing practice.

Assignment: (Not collected since before exam)

- (4.15a-179) Solid-Geometry Problems, Version A
- (CD#12, p655) Construct (with straightedge and compass) an isosceles right triangle given a leg.

Class # 19: Tuesday of week 10

Review class

Class #20: Thursday of week 10

Exam #2

Assignment # 16:

- (9.3-355) Area and Perimeter of Circles and Sectors
- (14.1-487) The Mira: What Does it Do?
- (15.1-509) Miniproject: Fold-and-Cut Paper Figures
- Bring miras to class.

Class #21: Tuesday of week 11

Group ^{ITP}(Early start): (9.1-351) Perimeter (Circumference) of a Circle

Assignment # 17:

- (9.1-351) Perimeter (Circumference) of a Circle
- (14.2-489) Reflection Lines and Point-Image Segments
- (15.2-511) Fold-and-Cut (Symmetric) Shapes
- (16.1-531) Four Actions: Slide, Flip, Turn, and Glide-Flip

Class #22: Thursday of week 11

Group ^{ITP}(Early start): (9.4-357) Area Problems with Circles, First try

Assignment # 18:

- (9.4-357) Area Problems with Circles, First Try
- (16.2-533) Four Symmetries
- (16.4-537) Problems: Four Actions or Symmetries
- (14.3-491) Constructions with a Mira (CDs)

Class # 23: Tuesday of week 12

Group ^{ITP}(Early start): Choose one from assignment.

Assignment # 19:

- (9.5-359) Problems: Area and Perimeter of Circles
- (15.3-513) Orientation: One or Two Sides?
- (16.6-541) Actions: Which of the Four Types?
- (16.7-543) Rotations and Glide-Reflections: Point-Image Segments
- (CD#12, 655) Construct (with mira) a right isosceles triangle given a leg.

Class # 24: Thursday of week 12

Group ^{ITP}(Early start): Choose one from assignment.

Assignment # 20:

- (9.11a-371) Problems: Geometry of Circles, Version A (Do numbers 1-4 only)
- (15.4a-515) Problems: Symmetry, Version A
- (16.8-545) How Do You Get from One to the Other?
- (16.9-547) CD Problem: Find the Center of Rotation
- (CD#20, 656) Construct (with mira) the reflection line taking one point to another.

Class # 25: Tuesday of week 13

Group ^{ITP}(Early start): Choose one from assignment.

Assignment: (Not collected since before exam)

- (16.10-549) CD Problem: Find Glide-Reflection Line
- (16.13a-557) Problems: Four Types of Symmetry, Version A
- (CD#20, 657) Construct (with mira) a kite given two sides.

Class # 26: Thursday of week 13

Review class

Class # 27: Tuesday of week 14

Hour Exam # 3

Class # 28: Thursday of week 14

Free class

Class # 29: Tuesday of week 15

Free class

Class # 30: Thursday of week 15

Free class