

FOR TEACHERS ONLY

The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION

P.S.–E.S. PHYSICAL SETTING/EARTH SCIENCE

Friday, January 25, 2019 — 9:15 a.m. to 12:15 p.m., only

SCORING KEY AND RATING GUIDE

Directions to the Teacher:

Refer to the directions on page 2 before rating student papers.

Updated information regarding the rating of this examination may be posted on the New York State Education Department’s web site during the rating period. Check this web site at: <http://www.p12.nysed.gov/assessment/> and select the link “Scoring Information” for any recently posted information regarding this examination. This site should be checked before the rating process for this examination begins and several times throughout the Regents Examination period.

Part A and Part B–1

Allow 1 credit for each correct response.

Part A

1 4	10 1	19 3	28 2
2 4	11 3	20 1	29 2
3 1	12 3	21 4	30 2
4 2	13 2	22 3	31 1
5 4	14 1	23 4	32 4
6 2	15 4	24 4	33 2
7 3	16 4	25 3	34 1
8 2	17 3	26 2	35 2
9 4	18 1	27 1	

Part B–1

36 3	40 2	44 4	48 1
37 1	41 2	45 3	49 2
38 2	42 1	46 3	50 4
39 4	43 1	47 3	

Directions to the Teacher

Follow the procedures below for scoring student answer papers for the Regents Examination in Physical Setting/Earth Science. Additional information about scoring is provided in the publication *Information Booklet for Scoring Regents Examinations in the Sciences*.

Do not attempt to correct the student's work by making insertions or changes of any kind. If the student's responses for the multiple-choice questions are being hand scored prior to being scanned, the scorer must be careful not to make any marks on the answer sheet except to record the scores in the designated score boxes. Marks elsewhere on the answer sheet will interfere with the accuracy of the scanning.

Allow 1 credit for each correct response.

At least two science teachers must participate in the scoring of the Part B–2 and Part C open-ended questions on a student's paper. Each of these teachers should be responsible for scoring a selected number of the open-ended questions on each answer paper. No one teacher is to score more than approximately one-half of the open-ended questions on a student's answer paper. Teachers may not score their own students' answer papers.

Students' responses must be scored strictly according to the Scoring Key and Rating Guide. For open-ended questions, credit may be allowed for responses other than those given in the rating guide if the response is a scientifically accurate answer to the question and demonstrates adequate knowledge as indicated by the examples in the rating guide. On the student's separate answer sheet, for each question, record the number of credits earned and the teacher's assigned rater/scorer letter.

Fractional credit is *not* allowed. Only whole-number credit may be given for a response. If the student gives more than one answer to a question, only the first answer should be rated. Units need not be given when the wording of the questions allows such omissions.

For hand scoring, raters should enter the scores earned in the appropriate boxes printed on the separate answer sheet. Next, the rater should add these scores and enter the total in the space provided. The student's score for the Earth Science Performance Test should be recorded in the space provided. Then the student's raw scores on the written test and the performance test should be converted to a scale score by using the conversion chart that will be posted on the Department's web site at: <http://www.p12.nysed.gov/assessment/> on Friday, January 25, 2019. The student's scale score should be entered in the box labeled "Scale Score" on the student's answer sheet. The scale score is the student's final examination score.

Schools are not permitted to rescore any of the open-ended questions on this exam after each question has been rated once, regardless of the final exam score. Schools are required to ensure that the raw scores have been added correctly and that the resulting scale score has been determined accurately.

Because scale scores corresponding to raw scores in the conversion chart may change from one administration to another, it is crucial that, for each administration, the conversion chart provided for that administration be used to determine the student's final score.

Part B–2

Allow a maximum of 15 credits for this part.

To ensure the accuracy of overlays, select a printer setting such as *full*, *actual size*, or *100%* when printing this document. Do **not** select the *fit to page* setting.

51 [1] Allow 1 credit if *only* the *three* boxes are checked as shown below.

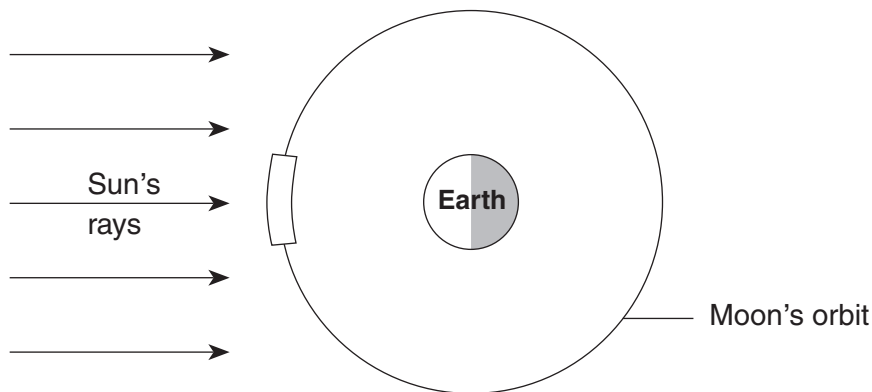
Note: Allow credit if a symbol other than a check mark is used.

New York State Location	Total Solar Eclipse Visible
Kingston	
Massena	✓
Niagara Falls	✓
Riverhead	
Oswego	✓

52 [1] Allow 1 credit if the center of the **X** is within or touches the clear band shown below.

Note: Allow credit if a symbol other than an **X** is used.

It is recommended that an overlay of the same scale as the student answer booklet be used to ensure reliability in rating.



(Not drawn to scale)

53 [1] Allow 1 credit for identifying *both* Plate A as the Philippine Plate and Plate B as the Pacific Plate.

54 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- convergent boundary
- convergence
- subduction
- plate collision

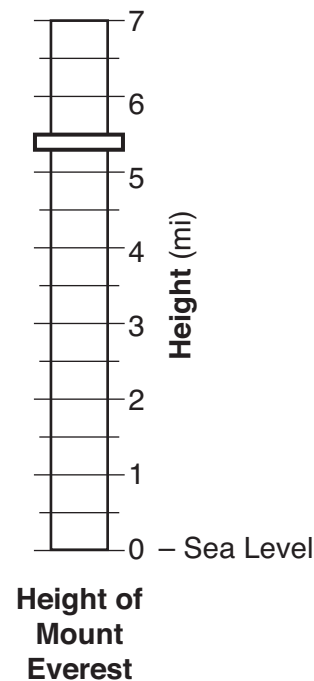
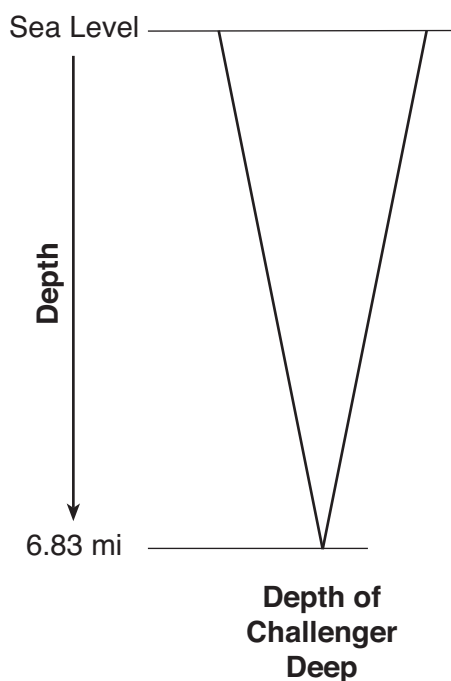
55 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- volcanoes/volcanic islands
- island arc/Mariana Island Group
- island of Guam/islands
- mountains
- seamounts
- faults

56 [1] Allow 1 credit if the student-drawn line is within or touches the rectangle shown.

Note: Do *not* allow credit if the student line is *only* on the “Depth of Challenger Deep” graph, because that is depth below sea level.

It is recommended that an overlay of the same scale as the student answer booklet be used to ensure reliability in rating.



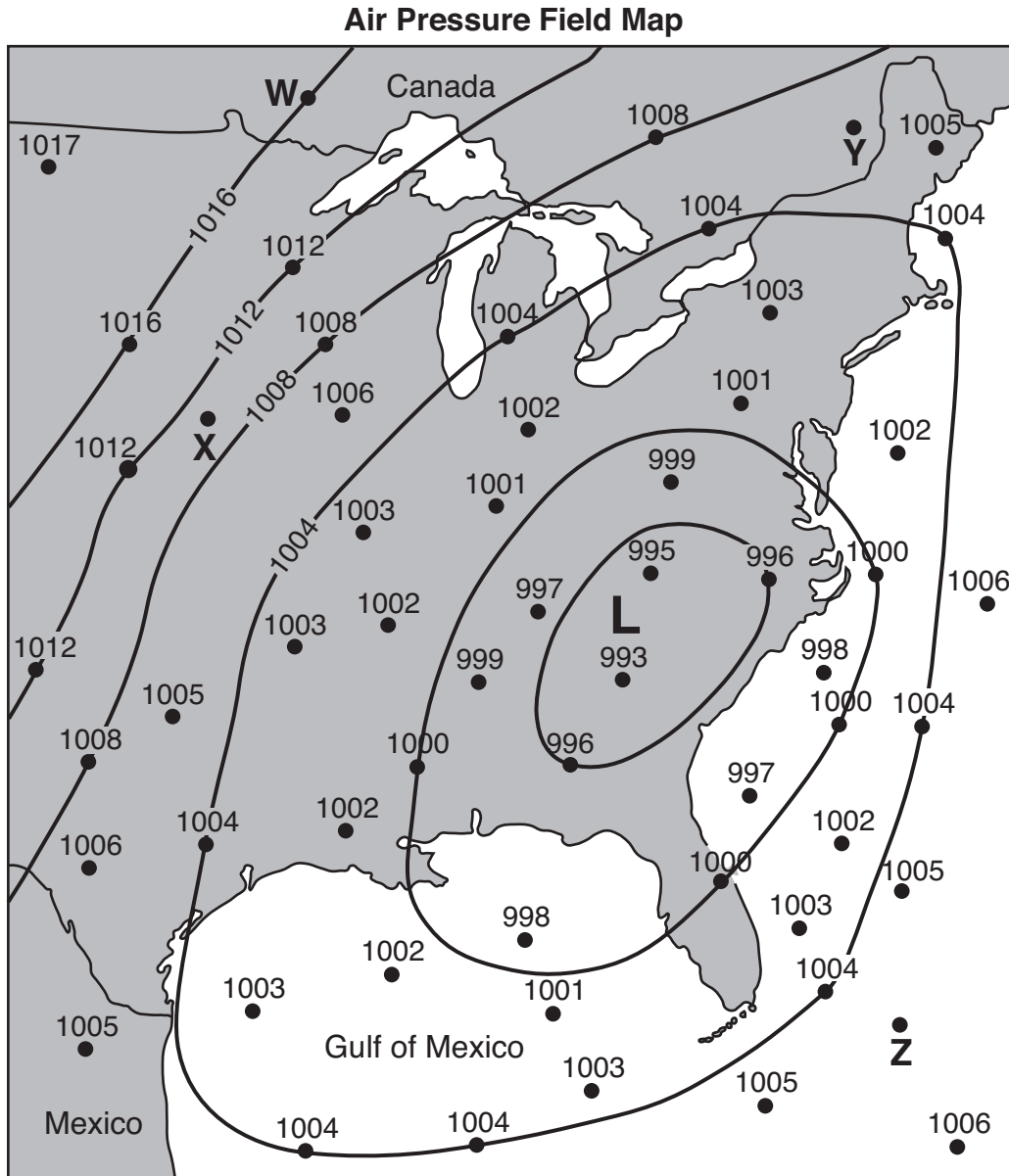
- 57 [1] Allow 1 credit for *Sirius*.
- 58 [1] Allow 1 credit for fusion *or* nuclear fusion.
- 59 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- blue
 - blue shift
 - violet
- 60 [1] Allow 1 credit for shading in *any* six additional carbon-14 boxes (leaving only six boxes unshaded).
- 61 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- ^{14}N
 - nitrogen-14
 - N-14
- 62 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
- The percent of ^{14}C would be undetectable in a 200-million-year-old *Coelophysis*.
 - Carbon-14 has too short a half-life.
 - Not enough carbon-14 remains in fossils more than 50,000 years old.
 - The fossil is too old to use ^{14}C .
 - Carbon-14 dating can only be used on organic specimens of recent age.
 - Too little of the radioactive sample would remain.
- Note:** Do *not* allow credit for the age of the *Coelophysis* fossil alone because this does not give a reason as to why C-14 cannot be used on a fossil of this age.
- 63 [1] Allow 1 credit for any value greater than 550 m, but less than 600 m.
- 64 [1] Allow 1 credit for any value from 38 m/km to 42 m/km.
- 65 [1] Allow 1 credit for northeast/NE *or* north northeast/NNE.

Part C

Allow a maximum of 20 credits for this part.

- 66 [1] Allow 1 credit if *both* the 1000 mb and 996 mb isobars are correctly drawn. The isobars must pass through or touch *both* 996 dots and *all four* 1000 dots. If additional isobars are drawn, *all* isobars must be correct to receive credit.

Example of a 1-credit response:



67 [1] Allow 1 credit for *both* letter X and acceptable evidence. Acceptable evidence includes, but is not limited to:

Evidence:

- The isobars are close/closest together at location X.
- Air pressure changes more over a shorter distance.
- The isolines/lines are closest.
- The air pressure gradient is greatest at X.

68 [1] Allow 1 credit for barometer *or* barograph.

69 [1] Allow 1 credit for *two* correct characteristics. The order of the characteristics may vary. Acceptable responses include, but are not limited to:

Characteristic 1:

- Winds blow inward/in.
- toward the center
- from higher to lower pressure
- Surface winds converge.

Characteristic 2:

- counterclockwise
- Winds are cyclonic.

70 [1] Allow 1 credit for mT. Allow credit for either uppercase or lowercase letters.

Note: Do *not* allow credit if air-mass letters are reversed, such as Tm or TM.

For students who used the Spanish edition, either exclusively or in conjunction with the English edition of the exam, allow credit for the correct two-letter air-mass symbol as it appears in either the English or Spanish *2011 Edition Reference Tables for Physical Setting/Earth Science*.

71 [1] Allow 1 credit for gravity *or* gravitation.

72 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- volcanic eruption
- asteroid impact
- hit by a meteor
- impact event

Note: Do *not* allow credit for “comet,” “asteroid,” *or* “meteor” alone because these are objects, *not* events.

73 [1] Allow 1 credit for 687 d.

74 [1] Allow 1 credit for *both* circling terrestrial planet and providing an acceptable explanation. Acceptable explanations include, but are not limited to:

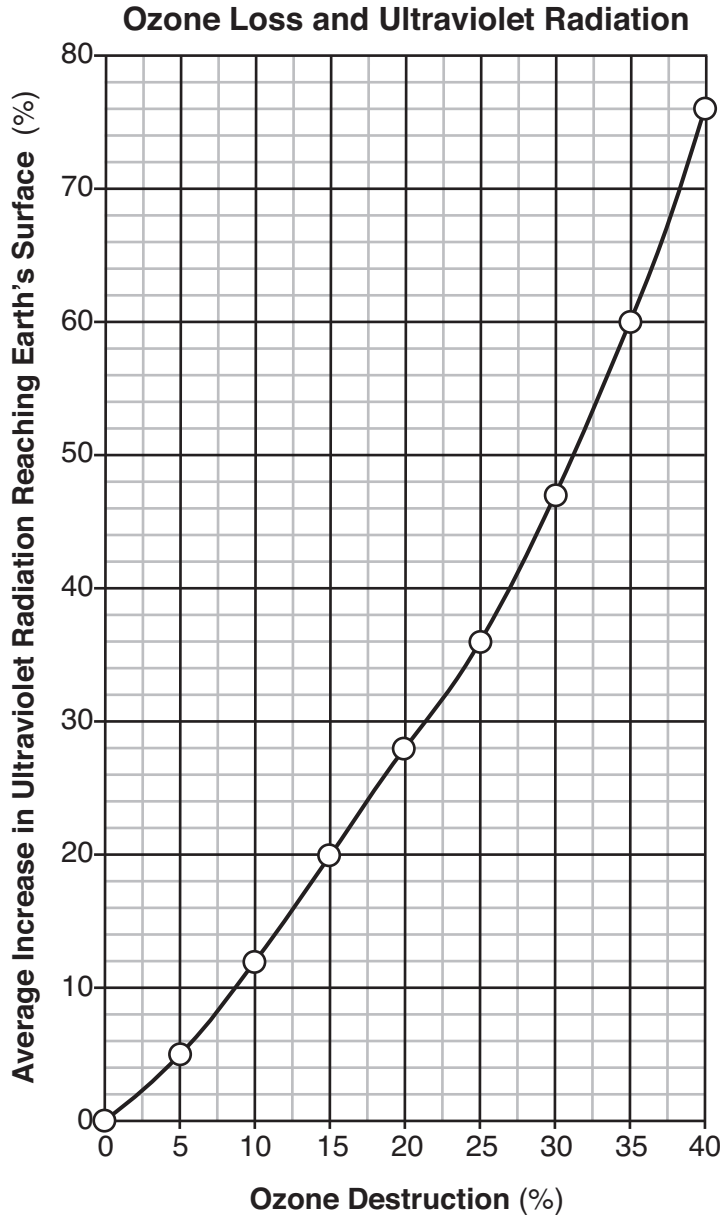
- Mars is a small rocky planet.
- The density of the planet Mars is large/has a high density.
- Mars is *not* made of mostly gases and liquids.
- Jovian planets are less dense and larger than terrestrial planets.

Note: Do *not* allow credit for “Mars is closer to the Sun” or “Mars is an inner planet” because these only indicate locations of terrestrial planets in our solar system.

75 [1] Allow 1 credit if the centers of *all nine* plots are within or touch the circles shown and are correctly connected with a line that passes within or touches each circle.

Note: Allow credit if the line does not pass through the student plots, but is still within or touching the circles.

It is recommended that an overlay of the same scale as the student answer booklet be used to ensure reliability in rating.



76 [1] Allow 1 credit for any value from 29% to 33%.

77 [1] Allow 1 credit for stratosphere.

78 [1] Allow 1 credit for a correctly completed chart as shown below.

Note: Allow credit if a symbol other than a check mark is used.

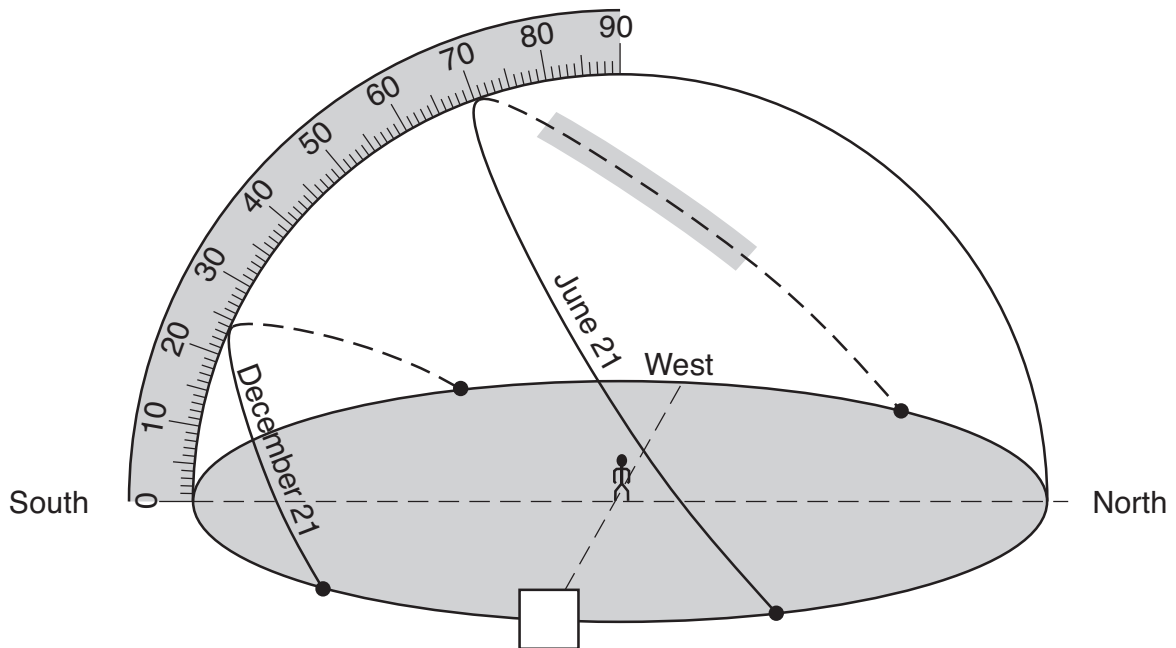
Wavelength Comparison to Ultraviolet (UV) Radiation

Type of Electromagnetic Radiation	All Wavelengths Shorter Than UV	All Wavelengths Longer Than UV	Some Wavelengths Shorter and Some Wavelengths the Same as UV
Gamma Rays	✓		
Microwaves		✓	
Visible light		✓	
X rays			✓

79 [1] Allow 1 credit for *two* correct responses. Acceptable responses include, but are not limited to:

- carbon dioxide/CO₂
- water vapor/H₂O
- methane/CH₄
- nitrous oxide/N₂O
- chlorofluorocarbons/CFC

80 [1] Allow 1 credit if the center of the **X** is within or touches the clear box shown below.



Note: Allow credit if a symbol other than an **X** is used. If a student correctly draws a line to represent the March 21 Sun's path, the sunrise position must still be indicated.

Regents Examination in Physical Setting/Earth Science

January 2019

Chart for Converting Total Test Raw Scores to Final Examination Scores (Scale Scores)

The Chart for Determining the Final Examination Score for the January 2019 Regents Examination in Physical Setting/Earth Science will be posted on the Department's web site at: <http://www.p12.nysed.gov/assessment/> on Friday, January 25, 2019. Conversion charts provided for previous administrations of the Regents Examination in Physical Setting/Earth Science must NOT be used to determine students' final scores for this administration.

Online Submission of Teacher Evaluations of the Test to the Department

Suggestions and feedback from teachers provide an important contribution to the test development process. The Department provides an online evaluation form for State assessments. It contains spaces for teachers to respond to several specific questions and to make suggestions. Instructions for completing the evaluation form are as follows:

1. Go to <http://www.forms2.nysed.gov/emsc/osa/exameval/reexameval.cfm>.
2. Select the test title.
3. Complete the required demographic fields.
4. Complete each evaluation question and provide comments in the space provided.
5. Click the **SUBMIT** button at the bottom of the page to submit the completed form.

Map to Core Curriculum

January 2019 Physical Setting/Earth Science			
Question Numbers			
Key Ideas/Performance Indicators	Part A	Part B	Part C
Standard 1			
Math Key Idea 1	14	37, 56, 60, 64	73, 75
Math Key Idea 2	8, 9, 11, 18, 22, 33	38, 57, 63	66, 76, 77, 78, 81
Math Key Idea 3	30		
Science Inquiry Key Idea 1	2, 7, 12, 13, 19, 31, 32	36, 38, 39, 42, 48, 55, 58, 59, 60, 61	70, 71, 72, 74, 79
Science Inquiry Key Idea 2			
Science Inquiry Key Idea 3	3, 5, 11, 15, 16, 17, 22, 24, 25, 26, 27, 28, 29, 30	37, 40, 41, 42, 43, 45, 50, 51, 53, 54, 57, 61, 62, 64	70, 73, 74, 77, 78, 83, 84
Engineering Design Key Idea 1			
Standard 2			
Key Idea 1			76
Key Idea 2			
Key Idea 3			
Standard 6			
Key Idea 1	10, 20, 21, 23, 35	44, 46, 47, 52, 59, 65	67, 68, 80
Key Idea 2	5, 6, 8, 15, 16, 18, 19, 21, 27, 28, 29, 31, 32, 34, 35	39, 40, 41, 42, 43, 44, 46, 47, 48, 49, 50, 51, 52, 53, 54, 60, 63, 65	66, 67, 69, 80, 81, 83, 84, 85
Key Idea 3	1, 14, 30	42, 56	78, 85
Key Idea 4	1		
Key Idea 5	4, 6, 9, 12, 33, 34	49	69, 76
Key Idea 6			
Standard 7			
Key Idea 1			
Key Idea 2			
Standard 4			
Key Idea 1	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 14, 16, 17, 30, 31, 33	36, 37, 38, 39, 40, 41, 51, 52, 57, 58, 60, 61, 62	73, 74, 80, 84, 85
Key Idea 2	11, 12, 13, 15, 18, 19, 20, 21, 22, 23, 32, 34, 35	40, 42, 43, 44, 45, 46, 47, 48, 49, 50, 53, 54, 55, 56, 63, 64, 65	66, 67, 68, 69, 70, 71, 72, 75, 76, 77, 78, 79
Key Idea 3	24, 25, 26, 27, 28, 29		83
Reference Tables			
ESRT 2011 Edition (Revised)	3, 5, 11, 15, 16, 17, 18, 22, 24, 25, 26, 27, 28, 29, 30	37, 40, 41, 42, 43, 45, 50, 51, 53, 54, 57, 61, 62, 64	70, 73, 74, 77, 78, 83, 84

