

FOR TEACHERS ONLY

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

PHYSICAL SETTING/CHEMISTRY

Tuesday, August 20, 2024 — 8:30 to 11:30 a.m., only

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: <https://www.nysed.gov/state-assessment/high-school-regents-examinations> 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.

Directions to the Teacher

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

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 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. Do not attempt to correct the student’s work by making insertions or changes of any kind. 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 box labeled “Total Raw Score.” Then the student’s raw score should be converted to a scale score by using the conversion chart that will be posted on the Department’s web site at: <https://www.nysed.gov/state-assessment/high-school-regents-examinations> on Tuesday, August 20, 2024. 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.

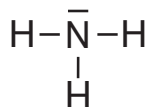
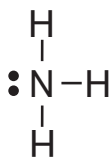
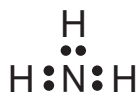
Because scale scores corresponding to raw scores in the conversion chart may change from one administration to another, it is crucial that, for each administration, the conversion chart provided for that administration be used to determine the student’s final score.

Part B–2

Allow a total of 15 credits for this part. The student must answer all questions in this part.

51 [1] Allow 1 credit.

Examples of 1-credit responses:



Note: Do *not* allow credit for $\bullet\bullet$ or $\bullet\text{—}\bullet$ or $\text{—}\bullet$ for a bond, because each \bullet represents one electron and each — represents two electrons.

52 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

The energy of an electron in the first shell is lower than the energy of the electron in the second shell.

The second shell electron has more energy.

An electron in the first shell has less.

53 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

$$\begin{array}{l} (62.93 \text{ u})(0.6915) + (64.93 \text{ u})(0.3085) \\ (69.15)(62.93) + (30.85)(64.93) \\ \hline 100 \\ (69.15\%)(62.93) + (30.85\%)(64.93) \end{array}$$

Note: Do *not* allow credit for a numerical setup using mass numbers rather than isotopic masses.

54 [1] Allow 1 credit for B *or* boron.

55 [1] Allow 1 credit for Li *or* lithium.

56 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

As the atomic number of the elements in Period 2 increases, the atomic radius generally decreases.

The radius gets smaller.

decreases

57 [1] Allow 1 credit for $\underline{\quad}$ $\text{Pb}(\text{NO}_3)_2(\text{aq}) + \underline{2}$ $\text{KI}(\text{aq}) \rightarrow \underline{\quad}$ $\text{PbI}_2(\text{s}) + \underline{2}$ $\text{KNO}_3(\text{aq})$

Allow credit even if the coefficient “1” is written in front of $\text{Pb}(\text{NO}_3)_2(\text{aq})$ and/or $\text{PbI}_2(\text{s})$.

58 [1] Allow 1 credit for potassium nitrate.

59 [1] Allow 1 credit for 461.0 g/mol *or* any value from 460.8 g/mol to 461.2 g/mol, inclusive.

60 [1] Allow 1 credit for propanone.

61 [1] Allow 1 credit for 8 kPa *or* any value from 7 kPa to 9 kPa, inclusive.

62 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

A water molecule has an asymmetrical distribution of charge.

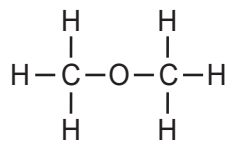
Charge distribution is uneven.

Center of positive and negative charges do not coincide.

63 [1] Allow 1 credit for alcohol *or* alcohols.

64 [1] Allow 1 credit.

Examples of 1-credit responses:



Note: Do *not* allow credit if only some of the H atoms bonded to C atoms are shown.

65 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

ethanoic acid

acetic acid

Part C

Allow a total of 20 credits for this part. The student must answer all questions in this part.

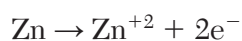
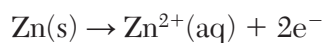
66 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

Most active metal: Mg
Least active metal: Ag

Most active metal: magnesium
Least active metal: silver

67 [1] Allow 1 credit for +5 or 5+.

68 [1] Allow 1 credit. Acceptable responses include, but are not limited to:



Note: Do *not* allow credit for the e without the minus sign (−).

69 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

copper

silver

Ag

Cu

70 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

As the $\text{NH}_4\text{Cl(s)}$ dissolves in the water, the temperature of the mixture decreases.

The temperature of the solution decreases.

Temperature goes down.

71 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

unsaturated

not saturated

72 [1] Allow 1 credit for NaCl *or* sodium chloride.

73 [1] Allow 1 credit for 0.860 mol *or* any value from 0.85 mol to 0.87 mol, inclusive.

74 [1] Allow 1 credit for 394 ppm.

75 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

The potential energy of the water molecules increases as the water evaporates.

Evaporation of the H₂O makes the PE of the molecules greater.

The molecules gain potential energy.

increases

76 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

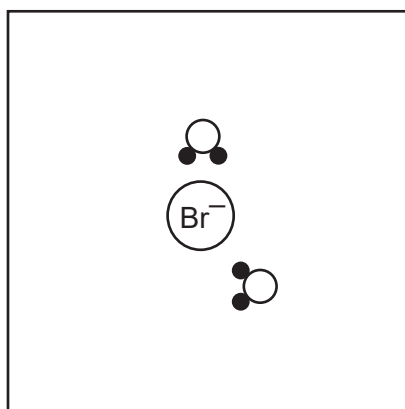
The concentration of the ions increases as the water evaporates.

Concentration goes up.

increases

77 [1] Allow 1 credit. Acceptable responses must show at least two water molecules. One *or* both hydrogen atoms in each water molecule may touch the bromide ion. At least one of the hydrogen atoms in each water molecule must face the bromide ion.

Example of a 1-credit response:

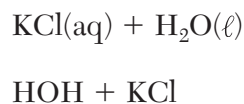


78 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

hydronium ion	H_3O^+
hydronium	H^+
hydrogen ion	$\text{H}_3\text{O}^+(\text{aq})$
hydrogen	$\text{H}^+(\text{aq})$

Note: Do *not* allow credit for H or H₂.

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



80 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

$$M_A(10.0 \text{ mL}) = (0.16 \text{ M})(15.0 \text{ mL})$$
$$\frac{(0.16\text{M})(15.0\text{mL})}{10.0 \text{ mL}}$$
$$\frac{(0.16)(15)}{10}$$

81 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

Multiple trials may improve the precision of results.

Each trial may involve errors, either above or below the acceptable value. Therefore, an average value may be more accurate.

Results can be shown to be reproducible.

Multiple trials may help cancel random errors.

82 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

2:2

$\frac{2}{2}$

1 to 1

83 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

beta decay

β^-

${}_{-1}^0\text{e}$

${}_{-1}^0\beta$

beta

beta particle

84 [1] Allow 1 credit for 24.62 y. Significant figures do *not* need to be shown.

85 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

Li-6

${}^6_3\text{Li}$

lithium-6

${}^6\text{Li}$

Regents Examination in Physical Setting/Chemistry

August 2024

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

The *Chart for Determining the Final Examination Score for the August 2024 Regents Examination in Physical Setting/Chemistry* will be posted on the Department's web site at: <https://www.nysed.gov/state-assessment/high-school-regents-examinations> on Tuesday, August 20, 2024. Conversion charts provided for previous administrations of the Regents Examination in Physical Setting/Chemistry 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 <https://www.surveymonkey.com/r/8LNLLDW>.
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

August 2024 Physical Setting/Chemistry			
Question Numbers			
Key Ideas/Performance Indicators	Part A	Part B	Part C
Standard 1			
Math Key Idea 1		31, 47, 53, 60, 61	80
Math Key Idea 2			82
Math Key Idea 3		36, 37, 48, 57, 59	67, 73, 74, 84
Science Inquiry Key Idea 1		33, 34, 38, 39, 40, 42, 43, 44, 45, 46, 49, 52, 54, 55, 56, 60, 62, 63, 64, 65	68, 70, 71, 72, 75, 76, 78, 81, 85
Science Inquiry Key Idea 2			
Science Inquiry Key Idea 3		31, 33, 34, 38, 39, 41, 42, 43, 44, 45, 46, 49, 50, 57, 58, 64, 65	66, 67, 68, 70, 71, 72, 77, 79, 82, 84, 85
Engineering Design Key Idea 1			
Standard 2			
Key Idea 1			
Key Idea 2			
Key Idea 3			
Standard 6			
Key Idea 1			
Key Idea 2		31, 51, 64	77
Key Idea 3			
Key Idea 4		40	
Key Idea 5			
Standard 7			
Key Idea 1			
Key Idea 2			
Standard 4 Process Skills			
Key Idea 3		32, 33, 35, 39, 40, 41, 42, 43, 44, 46, 48, 49, 54, 55, 56, 57, 59, 63	66, 68, 69, 71, 72, 73, 74, 79, 80, 83
Key Idea 4		37	70, 84, 85
Key idea 5		36, 51, 60	
Standard 4			
Key Idea 3	1, 2, 3, 5, 6, 12, 13, 14, 15, 18, 19, 20, 21, 22, 23, 24, 26, 27, 28	31, 32, 33, 34, 35, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 52, 53, 54, 55, 56, 57, 58, 59, 63, 64, 65	66, 67, 68, 69, 71, 72, 73, 74, 76, 78, 79, 80, 81, 82
Key Idea 4	16, 29	37	70, 75, 83, 84, 85
Key Idea 5	4, 7, 8, 9, 10, 11, 17, 25, 30	36, 51, 60, 61, 62	77
Reference Tables			
2011 Edition	1, 7, 8, 10, 13, 24, 25, 27	31, 32, 34, 35, 36, 37, 46, 51, 52, 54, 55, 56, 58, 59, 60, 61, 62, 63, 64, 65	66, 67, 68, 69, 70, 71, 72, 73, 74, 78, 80, 83, 84, 85