LESSON MAKER PRO

Predict, Check, Revise

Use rates to model change

HIGH SCHOOL · MM.M.A

MM.M.A "Mathematical modeling and statistical problem-solving are extensive, cyclical processes that can be used to answer significant real-world problems."

NAME _____ DATE _____

A MODEL CAN CHANGE

To model steady change, divide the change in output by the change in input. Use the rate to predict, then check new data to decide whether the model still fits.

WORKED EXAMPLE

A club tracks total sign-ups. If growth stays steady, predict the total at week 18.

CLUB SIGN-UPS

Week	Total sign-ups
14	43
16	49

1. Rate = (49 - 43)/(16 - 14) = 3 sign-ups per week.
2. Prediction = 49 + 3(18 - 16) = 55.

Answer: 55 sign-ups

PRACTICE 4 problems

1 A stream has 40 viewers at hour 0 and 64 at hour 4. Find the hourly change.

ANSWER _____

2 A game has 70 downloads and gains 9 each hour. Predict its total after 4 hours.

ANSWER _____

3 A model predicts 96 attendees, but 88 attend. Find actual minus predicted.

ANSWER _____

4 A model predicts 120 rides on Friday; the actual count is 132. Did it underpredict or overpredict, and by how much?

ANSWER _____

APPLY IT Show your work

1 An artist tracks print sales. If sales continue at a steady rate, predict the total at week 12.

PRINT SALES

Week	Total prints sold
0	80
4	144
8	208

ANSWER _____

2 A playlist has 90 saves on Monday and 126 on Thursday. Assume a steady daily increase. Predict Saturday's saves, then compare your prediction with the actual total of 158.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A student uses the first and last counts to model this club's growth at a steady rate. Test that model at the middle week. Then use the most recent rate to predict the count at week 12. Explain your choices.

CLUB MEMBERS

Week	Members
0	24
4	40
8	72

WORK SPACE AND ANSWER

Predict, Check, Revise

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A stream has 40 viewers at hour 0 and 64 at hour 4. Find the hourly change.	**6 viewers per hour**
2	A game has 70 downloads and gains 9 each hour. Predict its total after 4 hours.	**106 downloads**
3	A model predicts 96 attendees, but 88 attend. Find actual minus predicted.	**-8 attendees**
4	A model predicts 120 rides on Friday; the actual count is 132. Did it underpredict or overpredict, and by how much?	**It underpredicted by 12 rides.**

PART 2 · APPLY IT

1. **272 prints** Sales rise by 64 prints every 4 weeks, or 16 per week. Add 64 to the week 8 total.
2. **150 predicted saves; the actual total is 8 higher.** The playlist gains 36 saves in 3 days, or 12 per day. Saturday is 2 days after Thursday, so predict 126 + 24 = 150.

CHALLENGE

The first-to-last model predicts 48 members at week 4, but the actual count is 40, so it does not fit the middle count. The most recent rate is 8 members per week, which predicts 104 members at week 12.

Accept equivalent wording for comparisons. In the challenge, students should identify the mismatch before using the most recent rate.