**Culminating Task: Design Your City**

Grade 8 Math

Name: Date: Period: 



You are working for a Design Firm to accurately create a city design plan in the form of a map. No two buildings can occupy the exact same space. Since you are doing this for a company, it must be neat! Use a ruler to draw straight lines, please no free-hand- drawing of these or points will be deducted.

City Designers must accurately draw parallel, perpendicular, and transversal lines to create your city map design.

**To start your city:**

\_\_\_\_\_ Your city must have a name

\_\_\_\_\_ Your city must have at least 3 parallel streets (**each** street must be named)

\_\_\_\_\_ Your city must have at least 1 transversal street (**each** street must be named)

\_\_\_\_\_ Your city must have at least 1 perpendicular street (**each** street must be named)

**To complete your city:** Place the following buildings correctly based on the directions below.

*All buildings must be given names using signs either on or near the building.*

\_\_\_\_\_ Find a pair of alternate interior angles. Draw a pet shop and a school on the alternate interior angles.

\_\_\_\_\_ Find a pair of corresponding angles. Draw a bank and a post office on the corresponding angles. Additionally, the bank must be a dilation of the post office with a scale factor 2.

\_\_\_\_\_ Find a pair of alternate exterior angles. Draw a grocery and a movie theater on these angles.

\_\_\_\_\_ Find angles that are supplementary (or form a linear pair). Draw a restaurant and a gas station on these angles.

\_\_\_\_\_ Find a pair of vertical angles. Draw a fire department and hospital on the vertical angles. Additionally, the hospital should be a reflection of the fire department. Draw the line of reflection as a dotted line.

Once your city is fully designed, answer the following questions:

1. What sequence of transformations would take your grocery store to the location of your restaurant? Your description should be transformations relative to your street names.

2. Add a bowling alley to your city that is congruent to your post office. Prove their congruence using a sequence of transformations.

3. Add a gym to your city that is similar to your pet shop. Prove their similarity using a sequence of transformations.

4. What 3 streets form the parallel lines and transversal that make your grocery store and movie theatre alternate exterior angles? Explain using pictures and/or words.

Criteria A & Criteria D

|  |  |  |
| --- | --- | --- |
| **Achievement Level** | **Criteria A: Knowing & Understanding**Descriptor | **Criterion D: Applying Mathematics in real-life contexts**Descriptor |
| **7-8** | The student is able to:i. **select**  appropriate mathematics when solving challenging problems in both familiar and unfamiliar situations.ii. **apply** the selected mathematics successfully when solving these problemsiii. generally **solve** these problems correctly. | The student is able to:i. **identify** the relevant elements of the authentic real-life situation.ii. **select** appropriate mathematical strategies to model the authentic real-life situation.iii. **apply** the selected mathematical strategies to reach a correct solution.iv. **explain** the degree of accuracy of the solution.v. **explain** whether the solution makes sense in the context of the authentic real-life situation. |
| **5-6** | The student is able to:i. **select**  appropriate mathematics when solving challenging problems in familiar situations.ii. **apply** the selected mathematics successfully when solving these problemsiii. generally **solve** these problems correctly. | The student is able to: i. **identify** the relevant elements of the authentic real-life situation.ii. **select** adequate mathematical strategies to model the authentic real-life situation.iii. **apply** the selected mathematical strategies to reach a valid solution to the authentic real-life situation.iv. **describe** the degree of accuracy of the solution.v. **discuss** whether the solution makes sense in the context of the authentic real-life situation. |
| **3-4** | The student is able to:i. **select**  appropriate mathematics when solving more complex problems in familiar situations.ii. **apply** the selected mathematics successfully when solving these problemsiii. generally **solve** these problems correctly. | The student is able to:i. **identify** the relative elements of the authentic real-life situationii. **select**, with some success, adequate mathematical strategies to find a solution to model the authentic real-life situationiii. **apply** mathematical strategies to reach a solution to the authentic real-life situationiv. **describe** whether the solution makes sense in the context of the authentic real-life situation |
| **1-2** | The student is able to:i. **select**  appropriate mathematics when solving simple problems in familiar situations.ii. **apply** the selected mathematics successfully when solving these problemsiii. generally **solve** these problems correctly. | The student is able to:i. **identify** some of the elements of the authentic real-life situationii. **apply** mathematical strategies to find a solution to the authentic real-life situation, with limited success |
| **0** | The student does not reach a standard described by any of the descriptors below. | The student does not reach a standard described by any of the descriptors below. |



|  |  |
| --- | --- |
| STRUCTURE (2 points each) Name of City clearly labeledAt least 3 **parallel** streets clearly labeledAt least 1 street **perpendicular** to the others At least 1 **transversal** street | /8 |
| LOCATIONS (2 points each) A pet shop and a school (**alternate interior angles**)A bank and a post office (**corresponding angles**) A bank and a post office (**dilation scale factor 2**)A grocery and a movie theatre (**alternate exterior**)A restaurant and a gas station (**linear pair or supplementary**) A fire department and a hospital (**vertical angles**)The hospital is a reflection of the fire department (**line of reflection**) | /14 |
| QUESTIONS (4 points each)  | /16 |
| OTHER (2 points total)Neatness *(labeling is clear, use of appropriate paper, lines are straight)*Creativity Effort *(use of color, other additions to city)* | /2 |
| TOTAL Points | /40 |