

# Waconia City Planning Project

## OVERVIEW & OBJECTIVES

This lesson is designed to give students the opportunity to understand how geographic skills and tools can be used to solve real life problems. In this location lesson, students will identify and locate a restaurant for their community using ArcGIS. Students will review ArcGIS with several introductory activities as a pre-assessment of their understanding of geospatial technology. Waconia is the example used in this lesson, but any community may be used.

*Students will be able to...*

- Develop skills to effectively manipulate and use ArcGIS software.
- Analyze map layers to identify current conditions and predict future needs.
- Use geospatial technology to determine the best location for a restaurant.
- Justify their selection of the best location for a restaurant.

## GRADES

9<sup>th</sup>

## TIME

3-4 class periods

## REQUIRED MATERIALS

- ✓ Computer Internet access for students
- ✓ Handouts: “ArcGIS Online 3X3”; “Waconia City Planning Project”; “Grading Rubric”; “Waconia City Planning Paper: Peer Editing Instructions”; “Project Description Notebook File”

## MINNESOTA SOCIAL STUDIES STANDARDS & BENCHMARKS

**Standard 1.** People use geographic representations and geospatial technologies to acquire, process and report information within a spatial context.

**9.3.1.1.2** Apply geographic information from a variety of print and electronic sources to interpret the past and present and plan for the future; provide rationale for using specific technologies for each application.

**Standard 2.** Geographic Inquiry is a process in which people ask geographic questions and gather, organize and analyze information to solve problems and plan for the future.

**9.3.1.2.1** Use geospatial technologies to make and justify decisions about the best location for facilities.

## SUGGESTED PROCEDURE

Note: Students should be familiar with ArcGIS before this lesson. The pre-assessment confirms their understanding of this geospatial technology. I included a “Notebook File” with screen shots of the maps along with the step-by-step directions to support students when I taught this lesson.

### Day One

1. Begin class by giving students the pre-assessment, “ArcGIS Online 3X3”. This should ensure that the information from the previous class has been solidified and areas that need improvement are identified. The teacher may demonstrate the first activity with the students and then let them independently complete activities two and three. Correct and collect the formative assessment.
2. Next, distribute the “Waconia City Planning Project”. Introduce the project using the Notebook File and discuss the step-by-step process. Only discuss through Step 4, as that is all there will be time for today. Students will first look at the zoning maps for Waconia and discuss where a Central

Business District is located in Waconia. Then they will think of a restaurant that will be successful in Waconia. [Note: ArcGIS contains current zoning maps of your community.] The third step is deciding where in Waconia they want to build their restaurant. They need to look for open areas as well as areas that will be best suitable for a restaurant. Step 4 involves them going to ArcGIS and dropping a pin on the location. They will follow the directions under Step 4 to zoom in on their location and take a screen-shot to include in their student packet.

3. Give students the remaining class time to work on Steps 1-4. Remind them to think about the best location for their restaurant and to use the zoning maps to not only look for an open space, but also a Central Business District.

## Day Two

4. Begin Day 2 by discussing the basics of steps 5 & 6. Once again use the Notebook file to highlight key points and to show the example. Inform students they are going to start researching why their LOCATION is going to be a successful place to put a new restaurant. Explain that they will be adding layers to their map to see the data for Waconia. Demonstrate using the example in the Notebook file how the data can be used to make arguments in favor of their restaurant and location. Students notice how the layer is showing projected population growth for Big Lake, Minnesota. Explain that the location that I chose is in a part of Big Lake that is showing growth in the future. This data indicates that Big Lake's population is growing and a new restaurant would be feasible to meet the needs of its growing population.
5. Students need to analyze at least two ArcGIS layers. Students may use the list of recommended layers in "Waconia City Planning Project" or look for their own.
  - 2012-2017 USA Population Change
  - 2012 USA Population Younger than Age 18
  - Population Density Map
  - Median Family Income
  - Fast Food Restaurants
6. Next, explain that after they complete Step 5, they will be starting to formulate the main arguments for their essay. Students should use their main conclusions from each of the ArcGIS layers for the first two arguments and come up with another argument on their own. Students will complete the graphic organizer before starting Step 7. [Note: This lesson may be modified for students by limiting the layers to 2012-2017 USA Population Change and Population Density Map and reducing the paper to three paragraphs—introduction, conclusion, and body with the three reasons. A modified graphic organizer is included in the Waconia City Planning Project.]
7. Give students the remaining class period to complete Steps 5 and 6.

## Day Three

8. Begin Day 3 by explaining the basics of the paper. Using the Notebook file, remind students that they are not only recommending a restaurant, but more importantly the location. Students should avoid writing in first person; remind them that they are trying to convince the city to accept their plan. Also inform students that they will be doing peer editing tomorrow, so they should print their paper for tomorrow's class.
9. Give students the remainder of the class period to write their essay.

## Day Four

10. Begin Day 4 by having students peer-edit a classmate's paper. Students should use the peer editing form, "Waconia City Planning Essay Peer Editing Instructions". Once the students have completed peer editing, they should make changes to their paper and print their final draft. Note: If time does not allow for this, offer peer/parent/guardian editing as previous day's homework.

### **Extension**

Students read a brief article to identify factors that affect restaurant site selection. The article, “Choosing Your Restaurant’s Location”, examines details of demographics and locations to identify the best location for a restaurant.

### **Assessment**

- “ArcGIS Online 3X3” handout
- “Waconia City Planning Project” handout
- Culminating paper

### **Website Resources**

ArcGIS

<https://www.arcgis.com/>

“Waconia Zoning Map” (Current) from Planning and Zoning Department at City of Waconia

<http://www.waconia.org/DocumentCenter/Home/View/445>

“Waconia Comprehensive Map” (Future) from Planning and Zoning Department at City of Waconia

<http://www.waconia.org/168/City-Comprehensive-Plan>

“Choosing Your Restaurant’s Location” at Food Service Warehouse

<http://www.foodservicewarehouse.com/blog/new-restaurant-location/>

## ArcGIS Online 3X3

Maps are the first step in understanding where and why people, places, and things exist. ArcGIS is an online geospatial tool that allows users to create, analyze, and share maps. We will be using this program throughout the course, so this assignment introduces you to the basics.

TASK: You will be completing 3 tasks to get you acquainted with ArcGIS. At the end of each activity take a screenshot and paste it in the corresponding spaces below.

### ACTIVITY ONE: "See Your World"

1. Go to <http://www.arcgis.com> and click "Map"
2. Grab, hold, and move the map to pan.
3. Test *zooming in and out* using the map's zoom bar, the mouse's scroll wheel, and double clicking.
4. Zoom all the way out to the world and all the way in to your home. Notice what happens when you zoom in and out.
5. Use the *Search* box in the top right to find the address of a friend, a relative, or a place, like our capital city...do you remember it? :)
6. Click the *Basemap* button and look at each of the basemaps from all the way out to all the way in. List 4 features that you see on your map (bodies of water, street names, landmarks)

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7. Choose one basemap (other than the original) and take a screenshot. **Paste** the image below:  
↓ **YOUR PASTED IMAGE**



**ACTIVITY TWO: “Measure and Mark Your World”**

1. Zoom out to the world.
2. Click “*Measure*” and choose “*Length*”. (*Middle ruler icon*)
3. Measure (click to start, double-click to stop) the following distances and record your findings below:
  - a. Roughly the distance from western United States to Europe: \_\_\_\_\_
  - b. Western United States to central Asia: \_\_\_\_\_
  - c. Northern tip of Alaska to the southern tip of South America: \_\_\_\_\_
  - d. Southern tip of South America to the southern tip of Africa: \_\_\_\_\_
4. Change the measure tool from the ruler to the *location tool* (looks like a little box). Click it, wander the map, then zoom in and find the coordinates of the following and record them:  
Your Home: \_\_\_\_\_  
The White House: \_\_\_\_\_
5. Close the *Measure* tool.
6. Use the *Search* window atop the map to find “Mount Everest, Nepal.” In the window that pops up, click “*Add to Map Notes.*” See the new layer in “*Contents*” to the left of the map. Find “*White House,*” add it to “*Map Notes*”.
7. Above the map, click “*Modify Map*”. Click the White House Symbol you had added to the map, and click “*Edit,*” then click “*Change Symbol.*” Note the options for icon, size, and pull-down for different icon sets. Click “*OK,*” “*Close,*” and “*Details*” to stop editing.
8. Zoom back home. Above the map, click the “*Add*” button, choose “*Add Map Notes,*” and use the “*Map Notes*” template by clicking “*Create.*” Drop a pushpin on your home.
9. Find Waconia High School. Use the rectangle “*Area*” tool on the left side of the screen and find the approximate area for the school grounds.
10. Using the *Measure tool*, find the area of the grounds by double clicking just outside the top left corner of the your rectangle and click every corner. (Blue line should appear around your rectangle.)  
Area of the school grounds: \_\_\_\_\_
11. Take a screenshot of your map and **Paste** it below.

**↓ YOUR PASTED IMAGE**



**ACTIVITY THREE: “Explore Your World”**

1. At the top of the map, click “New Map”, and choose “Open.” This will give you a new clean map space, with the *Topo basemap*, and no additional layers. Zoom to see all of North America.
2. Choose “Modify Map,” and “Add/Search for Layers.” In the “Find” window, type “usa population”. Near the top, you should find “USA Population Density (Mature Support).” Click on the name, see a quick thumbnail, and click “Add to map.” Then, at the bottom of the left-hand window, click “Done Adding Layers.”
3. Zoom/pan so you can see all 50 states as states.
  1. What is the population density of Minnesota? \_\_\_\_\_
  2. What is the population density of California? \_\_\_\_\_
4. Zoom in to your county. What is the population density of your county? \_\_\_\_\_  
If people were spread out evenly, how many feet would be between each person? \_\_\_\_\_
5. Search your home address again. Zoom out until you see the orange of the Population Density map again. What is the population of your Block group? \_\_\_\_\_
  1. If people were spread out evenly, how many feet would be between each person? \_\_\_\_
  2. How does the number above compare to the county number you wrote in #4? \_\_\_\_\_
6. It sure would be nice to know what the colors mean! At the top of the left-hand window, click the “Legend” button (looks like a bulleted list) and see what the colors mean and if the colors and meanings change as you zoom in and out. What happens to the colors on the map as you zoom in from the state view to the counties view? \_\_\_\_\_
7. Pan around your state and see if every place looks alike. Wouldn’t it help to see through the population layer to the landmarks below? At the top of the left-hand window, click the “Contents” button (to the right of the “Legend” icon). Click the three dots after the name “USA Population Density” and see a menu of options, including “Transparency.” Click it, and play with the little slider.
8. Take a screenshot of the area of Minnesota that has the highest population densities.

↓ **YOUR PASTED IMAGE:** ↓

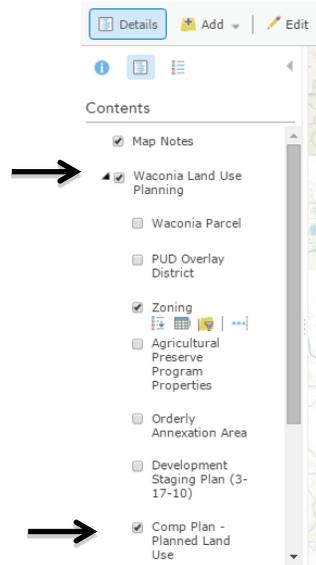


# WACONIA CITY PLANNING PROJECT

**Your Task:** You are an entrepreneur who desires to build a new restaurant in the city of Waconia. Your task will be to choose what new restaurant (restaurant, coffee shop, fast-food, etc.) you think will be successful in the city AND, more importantly, where the best location is to build it. You will need to assess current maps, existing restaurants, and future projections for the development of the city. You will then write a paper explaining what new restaurant you are going to create and argue why the location you chose is the best for the success of the restaurant.

**Step 1:** Analyze current maps of Waconia.

- Go to <http://www.arcgis.com/features/> and click “Map”
- Click “Modify Map” and zoom into Waconia, Minnesota. Click “Add to Map Notes”
- Then, add a layer to your map: Click “Add” and then “Search for Layers”
- In the “Search” box search: “Waconia Land Use Planning”. Once you see the layer click “Add”
- Click “Details” and click “Waconia Land Use Planning”
- Then check the “Zoning” and “Comp Plan-Planned Land Use” boxes



- To see what the colors mean, click on the tiny icon  Zoning

**Step 2:** Choose a restaurant to create (Type the name and type of restaurant below):

Type the name and type of restaurant below:

**Step 3:** Choose a location for your restaurant. Remember, you will be arguing why this location is ideal, so chose wisely!

Briefly write where your restaurant is located below:

Checkpoint. Is the location you identified in a commercial zone? (Highlight response) YES NO

**Step 4:** Locate and drop a pin on the site of your future restaurant.

- Go to <http://www.arcgis.com/features/> and click “Map”
- Click “Basemap” and change to “Imagery”
- Zoom in to locate the area you would like to place your restaurant. (Search the school’s address and location if you are choosing a restaurant in Waconia: 1300 Community Drive Waconia, MN)
- Click “Modify Map”
- Click “Add” and then “Add Map Notes” and “Create”
- Select “Pushpin” and place it on the map where your future restaurant will be
- Click “Change Symbol” and choose a new symbol to use. Enlarge the symbol size to at least 80.
- Take a screenshot of your map and place it below.

↓ **YOUR PASTED IMAGE:** ↓



**Step 5:** It’s time to defend your location! For at least 2 of the map layers briefly explain below what the map layer is showing and how it could apply to the location of your restaurant.

To add a layer to your map:

- Click “Add” and then “Search for Layers”
- In the “Search” box search one of the following:
  - 2012-2017 USA Population Change
  - 2012 USA Population Younger than Age 18

- Population Density Map
- Median Family Income
- Fast Food Restaurants

Layer Choice Number 1:

Explanation:

Layer Choice Number 2:

Explanation:

**Step 6:** In order to get your restaurant approved by city planners you need to formalize your proposal. Fill in the graphic organizer (separate page) laying out the reasons why the location you chose for your restaurant will make it successful using specific evidence from the maps and/or layers to create your arguments.

**Step 7:** Write 2 double-spaced pages in 12-point Times font, persuading the reader why the location you chose will be the best fit available for the restaurant to be a success. Your paper should refer to the maps you used at least twice. You should also include other factors that went into your choice, such as competition and traffic lights. Your paper should be in a 5-paragraph format, with an Introduction (introduce the restaurant and why the restaurant should be located where you put it), three body paragraphs explaining the three reasons why your restaurant will be successful in that location, and a Conclusion that summarizes the paper.

**Due Date:** \_\_\_\_\_

Thesis: (What restaurant do you want to add in Waconia and where?)



Reason 1:

Fact/Example:

Fact/Example:

Fact/Example:



Reason 2:

Fact/Example:

Fact/Example:

Fact/Example:



Reason 3:

Fact/Example:

Fact/Example:

Fact/Example:

Thesis: (What restaurant do you want to add in Waconia and where?)



Reason 1: *What did the 2012-2017 Population Change map tell you about Waconia, and where your restaurant would be located?*

Fact/Example:

Fact/Example:

Fact/Example:

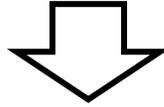


Reason 2: *What did the Population Density map tell you about Waconia, and where your restaurant would be located?*

Fact/Example:

Fact/Example:

Fact/Example:



Reason 3: *Why do you think your restaurant will do well in Waconia?*

Fact/Example:

Fact/Example:

Fact/Example:

## Waconia City Planning Project Grading Rubric

	<b>Weight</b>	<b>4-Excellent</b>	<b>3-Good</b>	<b>2-Fair</b>	<b>1-Poor</b>
<b>Introduction</b>	1x = 4	Has an interesting opening statement and a clear thesis statement.	Has a correct but bland introduction and a simple thesis statement.	Has an introduction but no thesis statement.	Has no introductory paragraph and no thesis statement.
<b>Conclusion</b>	1x = 4	Summarizes main ideas without giving new information. Has a strong closing statement.	Summarizes the main idea with no new information. Has a concluding statement.	Has a weak conclusion that gives new information or does not have a concluding statement.	Has no concluding paragraph; the essay stops abruptly.
<b>Ideas and Content (Body Paragraphs)</b>	3x = 12	The reasons are strong and supported with solid evidence. <b>The maps are specifically referenced 3 times.</b>	The reasons are reasonable and supported with evidence. <b>The maps are specifically referenced twice.</b>	The reasons are fair and the evidence is present, but without enough details to be well supported. <b>The maps are specifically referenced once.</b>	The reasons and evidence are not clear or the paper is too short to judge. The maps are not referenced.
<b>Organization</b>	1x = 4	Paper is organized by logic. Each paragraph has a topic sentence, relevant details, and smooth transitions to the next paragraph.	The organizational structure of this paper enhances and showcases the central idea or theme of the paper.	The paper is organized, but lacks some elements. The reader can read the text without confusion.	The writing lacks a clear sense of direction or is too short to judge.
<b>Conventions</b>	1x = 4	The writer demonstrates an excellent grasp of standard writing conventions (e.g., spelling, punctuation, capitalization, grammar usage, paragraphing)	The writer demonstrates a good grasp of standard writing conventions (e.g., spelling, punctuation, capitalization, grammar usage, paragraphing). Errors are occasional.	The writer has a basic grasp of standard writing conventions (e.g., spelling, punctuation, capitalization, grammar usage, paragraphing) with some mistakes present.	Too many errors in the paper make it hard to understand or the paper is too short to judge.

**Steps 1-5 are completed. Yes or No (4 points)**

**Graphic Organizer is completed. Yes or No (8 points)**

**Total Points: \_\_\_\_\_/40**

## Waconia City Planning Paper: Peer Editing Instructions

Your Name: \_\_\_\_\_ Author of Paper: \_\_\_\_\_

Directions: Circle "Yes" or "No" to the following statements.

- Yes No 1) There is an **introduction paragraph** that is at least 2-3 sentences long.
- Yes No 2) The introduction includes a **thesis statement** that names the restaurant the student believes should be added in Waconia and its LOCATION.
- Yes No 3) The introduction describes at least 3 reasons for adding the restaurant, and it is obvious the reasons will be discussed in more detail in the coming paragraphs.
- Yes No 4) Reason 1 is strong and is backed up with at least 3 facts or pieces of evidence
- Yes No 5) Reason 2 is strong and is backed up with at least 3 facts or pieces of evidence
- Yes No 6) Reason 3 is strong and is backed up with at least 3 facts or pieces of evidence
- Yes No 7) The student references/uses the maps in his/her essay at least 3 times.
- Yes No 8) The **conclusion paragraph** is at least 2-3 sentences long that restates the thesis (the restaurant he/she believes should be added in Waconia and the reasons)
- Yes No 9) The paper has **proper formatting** (12 point, Times font, double-spaced)
- Yes No 10) **Spelling and grammar** mistakes have been noted and corrected.

Answer the following questions:

- What restaurant did the student add in Waconia? Where will it be located?
- What are the three main reasons for adding the restaurant?
- What are two things the writer did well?
- What are two things the writer could improve upon?

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Signature of Peer Reviewer

Relation (Classmate, Parent)

Date

## Project Description Notebook Files (Screen=shots)

# WACONIA CITY PLANNING PROJECT

**Learning Target:** I can use geographical skills and tools to solve real life problems and plan for the future

**Your Task:** You are an entrepreneur who desires to build a new restaurant in the city of Waconia. Your task will be to choose what new restaurant (restaurant, coffee shop, fast-food, etc.) you think will be successful in the city AND, more importantly, where the best location is to build it. You will need to assess current maps, existing restaurants, and future projections for the development of the city. You will then write a paper explaining what new restaurant you are going to create and argue why the location you chose is the best for the success of the restaurant.

**Step 1:** Analyze the current map of Waconia as well as the map of existing food industry businesses in the city. Then look at the Waconia Comprehensive Map that shows future land use projects of the city.

Use the following resources to learn about Waconia. (All maps can also be found on our Schoology page. Check the "Assignments" folder.)

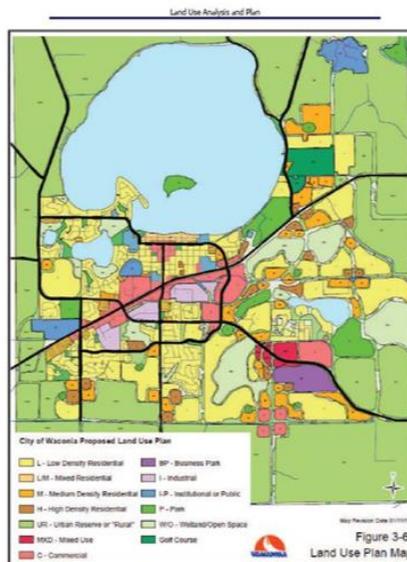
- **Waconia Zoning Map** (Current Map)
- **Waconia Comprehensive Map** (Future Map)
- **ArcGIS Maps**

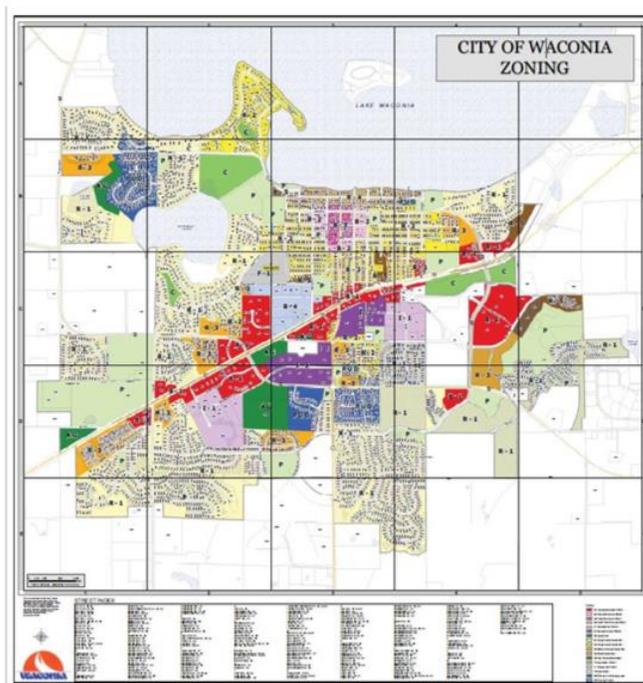
### Remember how to read a Zone Map:

All cities have 3 basic zones:

1. **Central Business District (Red)**
2. **Industrial (Purple)**
3. **Residential (Yellow)**

*In what zone would a restaurant make the most sense?*





**Step 2:** Choose a restaurant to create (name and type of restaurant):

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**Step 3:** Choose a location for your restaurant: (Write where your restaurant is located, being specific as possible).

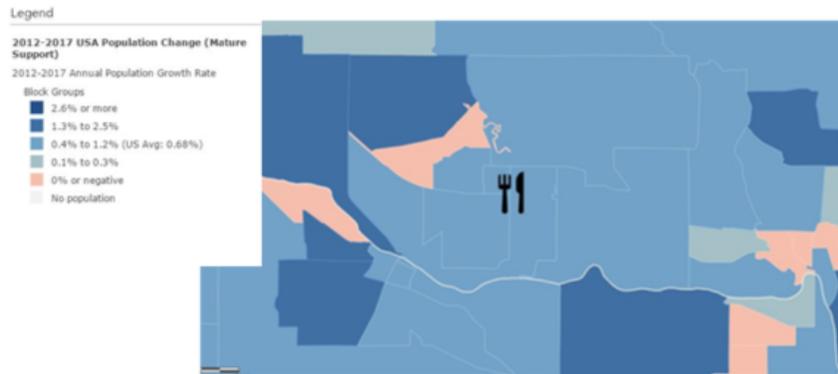
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**Step 4:** Using ArcGIS locate and drop a pin on the site of your future restaurant. Take a screen shot of the location.

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**Step 5:** It's time to defend your location! Analyze at least 2 of the map layers on ArcGIS. Briefly explain what the map layer is showing and how it could apply to the location of your restaurant.



**Step 6:** Fill in the graphic organizer laying out the reasons why the location you chose for your restaurant will make it successful using specific evidence from the maps/layers to create your arguments.



**Step 7:** Write an essay explaining your choice in restaurant, as well as your ideal location. Your essay to refer to the maps you used at least twice. You should also include other factors that went into your choice. Ex. competition, traffic lights, etc.

Grading Rubric

	Weight	4-Excellent	3-Good	2-Fair	1-Poor
Introduction	1x=4	Has an interesting opening statement and a clear thesis statement.	Has a correct but bland introduction, and a simple thesis statement.	Has an introduction, but no thesis statement.	Has no introductory paragraph, and no thesis statement.
Conclusion	1x=4	Summarizes main ideas without giving new information. Has a strong closing statement.	The concluding paragraph summarizes the main idea with no new information. Has a concluding statement.	Has a weak conclusion that gives new information, or does not have a concluding statement.	Has no concluding paragraph, the essay stops abruptly.
Ideas and Content (Body Paragraphs)	3x=12	The reasons are strong, and backed up with solid evidence. The reasons are backed up. <b>The maps are specifically referenced 3 times.</b>	The reasons are reasonable, and supported by evidence. The reasons are evident. <b>The maps are referenced specifically 2 times.</b>	The reasons are fair, and the evidence is present, but without enough details to be well supported. <b>The maps are referenced specifically 1 time.</b>	The reasons and evidence are not clear, and the arguments fail to hold up. Or the paper is too short to judge. The maps are not referenced.
Organization	1x=4	Paper is organized by logic. Each paragraph has a topic sentence, relevant details, and transitions to the next paragraph smoothly.	The organizational structure of this paper enhances and showcases the central idea or theme of the paper.	The paper is organized, but lacks some elements. The reader can read the text without confusion.	The writing lacks a clear sense of direction, or is too short to have any organization. Or the paper is too short to judge.
Conventions	1x=4	The writer demonstrates an excellent grasp of standard writing conventions (e.g., spelling, punctuation, capitalization, grammar usage, paragraphing)	The writer demonstrates a good grasp of standard writing conventions (e.g., spelling, punctuation, capitalization, grammar usage, paragraphing) Errors are occasional.	The writer has a basic grasp of standard writing conventions (e.g., spelling, punctuation, capitalization, grammar usage, paragraphing) with some mistakes present.	Too many errors in the paper make it hard to understand. Or the paper is too short to judge.

Steps 1-5 and Graphic Organizer are completed. Yes or No (12 points)

Total Points: \_\_\_\_\_/40

**Reminders:**

**#1: Paper Arguments:** Remember, you are focusing on location as much as possible. You must build in Commercial/Business areas—can be an argument too!

**#2: Details:** When describing location you need to use as many details as you can!

- Title of the map
- Color of the zones/layers and what they mean
- Region number (B-1 is where Target is located)
- Road names

**#3: Graphic Organizer check-in: Let me know when you're done!**

**#4: PRINT Rough Draft:** Peer editing will take place tomorrow.

**Paper Pointers:**

**Introduction** should include:  
-Interesting grabber statement

-**Thesis statement**- answers the question: Why is your restaurant and its the *location* best for Waconia?  
-Overview of Arguments

**Body Paragraphs** (3) Each Paragraph should include:  
-A topic sentence stating a specific argument supporting why your business' location will be a success.  
-3 SPECIFIC examples or facts to support your argument.  
-A Transition Sentence to the next argument. (Try to avoid: "The next reason is..." instead put something like "The success of Chipotle will also be aided by future development."

**Conclusion** should include:  
-A summary of the main ideas (arguments/reasons) of the paper.  
-A strong closing statement defending why your restaurant should be in Waconia.

**DON'T FORGET TO EDIT for spelling and grammar mistakes!**

**TURNING IN YOUR PAPER**  
Submit entire document to Schoology.  
  
Final Draft Due **FRIDAY**