MAT 221 **Cinconia** **Name**:_____

Today you will

- select a Cinconia system for your group to use based on the individual work of your group members or at least inspired by the ideas from your group members.
- fill in the table again, this time with the system you are going to use. (*Work in* PENCIL *so that you can erase*.)
- give the system you created a name.
- work on activities using your system.
- divide up the responsibilities to bring supplies to make a poster (in 60 minutes of class time during our next class on Wednesday, Oct 6, 2010.)

Organize the following before you leave:

- Your group will create a poster-board introducing your number system to the rest of the class. On it, you will show how your numeration system works. Next class, please bring poster board and other utensils to creatively display your number system.
  Divide up the responsibilities of bringing what is needed.
- Make sure you have all names, phone numbers and contact email addresses of your group members. In case you are getting sick, you have to inform the other group members of what materials they now need to bring, since you will not be present.

If you have time left over:

- Make a plan on what your group will put on the poster. (Refer below for details.)

Your HOMEWORK for next class:

- Finish the worksheet if you did not get all the way through as a group.
- Make a rough plan on what you want your group to put on the poster. You will have to work efficiently next class, so the more thought you already gave it the better. (Make sure to read the explanation below about the poster.)

The poster:

You will not be allowed to use any numbers on your poster. You also may not use numbers written in words – as you would on a check.

You will NOT present on your poster. It has to be self explanatory to a person, who has not seen or used your number system before. Whether you show larger numbers or addition or subtraction on the poster, is up to you. The goal is to introduce the other groups to your number system, just through the poster. We will have time to look at the posters, but groups are not allowed to explain how their system works. The poster itself must say it all. Explanations may be included, but if you include explanations, keep them to a minimum and write LARGE. And don't let the creation of the poster take up too much time. All you will have is 60 minutes. We will look at your poster at the end of class, no matter what state it is in.

Lastly, posters may not be started at home. The group has to work on the poster together in class. (You can prefabricate some symbols, etc. but the layout should be done together.)

MAT 221 Cinconia Name:_____

1) List your 5 symbols (*Remember: NO alphanumeric symbols, so no numbers and no letters.*)

2) Fill in the table. (Don't forget to fill in "no pebbles." You must provide a symbol for it.)

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Don't forget to fill me in!

Old system	New System
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3) a) Look at the way your group is using the symbols to create a number system in which you eventually will have to be able to do simple arithmetic. Your goal is to check each of the following:

Question: Does your number system allow you to write any number you can think of? **Yes** ☐

Question: Does each value have a unique representation in your number system? (No number can be displayed more than one unique way.) **Yes** ☐

Question: Are you only using 5 symbols? **Yes** ☐

Question: Are the numbers reasonable in length when your are writing them down? Will they remain reasonable in length for large values, i.e. for many sticks? *This may be the requirement to give you the most trouble, but it is worthwhile to settle on an idea for a system only if it fulfills this requirement.* **Yes** ☐

Question: Are you making sure that you do not have exactly 10 options that are just "renamed" digits 1, 2, 3, 4, 5, 6, 7, 8, 9, and 0? (*This will ensure that you do not simply "reinvent" our existing base* 10 *number system*.) **Yes** ☐

Question: Can everyone in your group explain how to count in your number system to a stranger? **Yes** ☐

If you did <u>not</u> answer yes to each of the above questions, you will need to reevaluate how you have chosen to use your symbols. Find an alternative that will fulfill all of the above criteria. Fill in the table again with your alternative system.

b) As a group, **give your system a name**. Be creative. Maybe you will think of something catchy or something that is easy to memorize and refer to.

Our number system is called: ☐

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GO TO THE **NEXT PAGE**.

In the following, try to communicate in sticks and pebbles and in your new number system as much as possible, i.e. try to translate directly.
Use numbers from our usual number system as little as possible.

4. Pick four numbers that are **larger than "fifteen sticks"**. Write them down as examples of "large numbers". The examples you are picking should not be four consecutive numbers after fifteen sticks, but a variety of examples involving different numbers of sticks and pebbles. Pick **at least two** examples that contain **both, sticks and pebbles**. Show your examples in the table below.

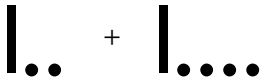
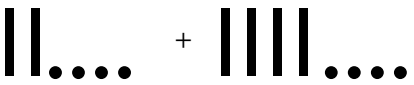
Example expressed in the old number system (with Sticks and/or Pebbles)	**Example expressed in your NEW number system**

5. Pick two numbers that are **larger than "twenty-five" sticks**. Write them down as examples of even larger numbers. The examples you are picking should not be two consecutive numbers after twenty-five sticks. Just pick a different number of sticks and on at least one of your examples use pebbles as well. Show your examples in the table below

Example expressed in the old number system (with Sticks and/or Pebbles)	**Example expressed in your NEW number system**

6. Express the following given number in your NEW number system: "**fifty-three sticks, four pebbles**" (This will show you if your numbers are becoming too large to write down. A good system has a reasonable number of symbols involved in the translation of "fifty-three sticks, four pebbles".) Note: No need to draw sticks and pebbles.

7. How will you **add** in your number system? For each set of numbers below given in the old numeration system, show how you will add the corresponding numbers in your new number system. *Note: When you are adding in **your** number system, you are not allowed translate into base 10 and then simply add in base 10, nor should you find the sum with sticks and pebbles and then merely translate the result in your number system. You really need to ADD in YOUR number system.*

Old number system	New number system (*Show your work*.)
	
	
	
	

If you have time left over: Make a plan on what you want to put on the poster.