Level: E2
Standard: Math E45c Estimation, including rounding
Materials Needed: Golden Beads
Previous Knowledge: Students need to have worked with the Decimal Bead material previously. They need to have a concept of numbers and know how much 1, .1, .01, .001, .0001 etc...
Goal: Students can understand and apply estimation in their work.

Procedure:
1.) Begin lesson by putting out a number of decimal beads.
2.) Have students tell you how much is there

3.) After determining that the students remember how to use the material put out another number. (with only tenths and hundredths)
4.) Ask the students to guess how many beads there are.
5.) Students can count the beads.
6.) After they have determined how many beads there are, explain that it take a long time to count out that many beads.
7.) Explain to the students that we use 'estimation' to guess how many beads are.
8.) We can say that there are 'about 52.25 beads'.
9.) Explain that estimation is the closest guess that we can give. We can not say that there are 52.7 beads, or that there are 51 beads.
10.) For the rest of the lesson the teacher will be putting out groups of numbers and the students need to guess which ten it is closets to.
11.) For example.
- Put out 1.82 beads. Is the number closer to 1.8 or 1.9?
- Put out 3.27 beads. Is it closer to 3.2 or 3.3.

12.) If students are still having problems, show them by counting. 1.82 is only 2 away from 1.8; but it is 8 away from 1.9. 1.82 is closer to 1.8. When we round the number 1.82 to the nearest 10th, we would round 1.82 to 1.8.

Follow-Up work:
- Students can take out beads on their own and grab a hand-full and estimate.
- The can work with a friends and have a friend estimate

Extensions

- Students continue their estimation work with rounding to the nearest 100^{th}, 1000^{th}, $10{,}000^{th}$ etc
- Work can be done with money as well
    - After students have a concept of money they can use estimation with pennies.
    - Is 18 cents closer to 10 cents or 20 cents? Write is out with the decimal point $1.82 is closer to $1.80