

# Understanding Impact Probability

Name: \_\_\_\_\_

*65 million years ago, the dinosaurs were wiped out by the impact of an asteroid about 10 km across. An impact like this occurs once every 100 million years.*

## Making a Prediction:

1. Given the above information, when would be the most likely time the next impact of this size would occur?

## Testing your Prediction:

2. On your table, you will find a deck of cards and a number written on the table.
  - a. Choose which of you will be the dealer, and which the recorder. Record your number here: \_\_\_\_\_.
  - b. You will use only the cards outside of the box. Therefore your deck contains 40 cards – aces through tens of each suit. Therefore you'd expect your number to occur approximately every tenth card.
3. One card at a time, the dealer should flip over the top card on the deck. Was it your number? If no, flip the next card. If yes, have the recorder mark an "X" just above the tick mark for 1 on the line below.



4. Repeat step 3 for all the cards in the deck. If, for example, the 8<sup>th</sup>, 17<sup>th</sup>, 22<sup>nd</sup> and 23<sup>rd</sup> cards are your number, you should have an "X" above each of these tick marks.
5. Hand in your sheet while we collect the answers – we'll come back to this!
6. On the master sheet, do numbers appear at regular intervals, or do they seem to be randomly distributed?
7. Cards in the deck are randomly distributed. Asteroids and comets are randomly distributed in space. Does a chance of an impact every 100 million years mean
  - a. that if an impact occurred now another one won't occur for the next 99,999,999 years?
  - b. that one *must* occur once within every 100 million year interval? [Hint: does every interval of 10 cards have 1 and only 1 "X"?]