




This unit is designed to fit in with the study of Measurement, Chance and Data at Year 7, in particular the use of random number generators to simulate experiments based on equally likely outcomes. It can be completed in a double period, and so both worksheets could be handed out together.

1. Discuss with students how various phrases are used to indicate the likelihood of a particular event occurring. On what basis are phrases like 'almost certain', 'no chance' or '50-50' used to describe likelihood? Emphasise the role of data already obtained that might be used to inform such phrases.
2. Hand out Worksheet 1 which is designed to familiarise students with random number generators and their use in simulating chance events. 
3. The first part of Worksheet 1 introduces the basic random integer function, and how it can be modified to generate random numbers within a specified range. Students then use a similar command to generate the appropriate random integer from 1 to 6 inclusive.
4. Once students are familiar with the way the **randint** command works, allow them to collect the data for the first experiment. Remind them that the calculator permits scrolling back through (for the purpose of accurate tallying) previous entries to see the results of each of the 60 trials.
5. The use of statistical tools to analyse the experimental results provides a good link between the study of Chance and Data – the table and chart are useful tools for looking at the relative frequencies.
6. Before asking them to construct the bar chart, provide some time for students to compare the results with other students in the class. This permits students to see the variation possible in frequencies for a relatively small number of trials.
7. Worksheet 2 focuses on the sum of two dice experiments, where the possibility of multiple outcomes for a given sum is possible. This permits discussion about the difference between outcomes and events. For instance, each of the 36 outcomes is equally likely but the event '*a sum of 3*' and '*a sum of 6*' are not equally likely. It also introduces relative frequency as an approximation to the theoretical probability of a particular outcome. 
8. The final part of this worksheet introduces the relationship between theoretical probability and experimental outcomes. Students compare the theoretical values with the relative frequencies obtained via a simulation experiment.
9. Students can be given the **Assessment Task** at the end of this document to check their basic skills and concept understanding of the materials covered in this Unit. 
10. **Extensions:** Other simulations are possible. For instance, a game of cricket can be simulated by using a random integer for runs (eg. 1, 2, 3, 4 and 6) or a wicket (eg. 5)

# TI-30XB MultiView™ That's So Random!



This Unit includes:

• Teacher Notes & Lesson Overview

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• Teacher PowerPoint

PPT

• Worksheets 1 & 2

W

• Student Assessment Task

AT

• Solutions to Student Worksheets

WS

• Solutions to Assessment Task

ATS

To obtain the complete set of units available please  
email [teacher-support@list.ti.com](mailto:teacher-support@list.ti.com)



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# Curriculum Links

## TI-30XB MultiView™: That's So Random!

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### Year 7 Measurement, Chance and Data

#### Statement of Learning Opportunities

- Students comprehend that many events, in familiar situations, have different likelihoods of occurrence, and make and interpret empirical estimates of probabilities related to these events. They compare experimental data for simple chance events with theoretical probability obtained from proportions expressed as percentages, fractions or decimals between 0 and 1, based on counting or area. They distinguish events that are equally likely from those that are not.
- They use frequency, relative frequency and choose suitable measures of location (mean, median, mode) as summary statistics to describe the distribution of sample data from a given context.

#### Key Ideas

- Introduction of random number commands to generate random integers in a specified range
- The use of random integers to simulate experiments involving chance events
- Concept of equally likely outcomes
- The difference between an outcome and an event
- The link between relative frequency of an outcome and the theoretical probability associated with that outcome

#### Key Vocabulary

Random numbers, integers, frequency & relative frequency, bar chart, outcomes, events, experiments, trials, probability

#### Lesson Overview

- i) Introduction of random numbers and random integers (Worksheet 1)
- ii) The application of random integers to simulating random experiments
- iii) Conducting a single die experiment with  $n = 60$  trials
- iv) Production of a frequency table and bar chart
- v) Interpretation of experimental results
- vi) Consideration of two-dice sum experiment, with  $n = 100$  trials (Worksheet 2)
- vii) Production of a frequency table and bar chart
- viii) Exploration of expected frequencies and relative frequencies of an outcome or event
- ix) Discussion of the difference between an outcome and an event
- x) Link between experimental relative frequencies and theoretical probabilities

#### Equipment

- Worksheets 1 and 2
- TI-30XB MultiView™ or other calculator capable of following features
  - Generating random integers
  - List formulas

## Curriculum Links

### TI-30XB MultiView™: Algebra Rules!

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#### Indicators of Success

- Students are able to use a random integer command to simulate simple experiments where outcomes are affected by chance
- Students are able to use statistical tools such as frequency and relative frequency tables and bar charts to analyse the results of such experiments
- Students are able to demonstrate an understanding of how the relative frequencies from such experiments will approach the theoretical probabilities as the number of trials becomes large