The binomial distribution (AS)

N1   Understand and use simple, discrete probability distributions (calculation of mean and variance of discrete random variables is excluded), including the binomial distribution, as a model; calculate probabilities using the binomial distribution.

For a brief commentary on this content go to the MEI outline SoW.

Pre-requisites

- GCSE: Know that the sum of all probabilities is 1.
- AS Probability: Finding probabilities from a two-way table and tree diagrams.
- AS Pure: Binomial expansions.

Common student errors

- Confusing $P(X = r)$ and $P(X \leq r)$.
- Forgetting about $P(X = 0)$ when calculating $P(X \leq 2)$.
- Overstating the accuracy of a result against the context of the question.

Teaching it!

- **Coming soon** A series of videos designed to support students on this topic.
- A lesson plan for Introducing the Binomial Distribution.
- Plinko Probability: A simulation exploring Binomial Distribution.
- Binomial jigsaw: A hexagonal matching task.
- Using binomial probabilities: A Standards Unit: Improving Learning in Mathematics resource. Full resource available from STEM Centre elibrary via free account login.
- Binomial or not?: Nrich activity considering when a Binomial Distribution is appropriate.
- Interactive graphs showing binomial probabilities: GeoGebra, Desmos.
- Casio graphic calculator student task: Discrete random variables, Binomial distribution

Getting them thinking

- Make up three questions that show you understand how the Binomial Distribution can be used in context.
- How can we be sure that $\sum P(X = r) = 1$?
- How many dice would you need to roll to be 99% certain of getting at least one six? Look into how airlines use a similar strategy when selling seats for flights – they can sell more tickets than seats because they know some people won't turn up!