

Reading Questions Week 5

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Q1 What is the size of the sample space?

The size of the sample space is 6.

Q2 Given the scenario description, how many ways are there to collect two acorns of the *same species*?

There are three ways to collect two acorns of the same species.

Q3 Given the scenario description, how many ways can you collect two acorns of *different species*?

There are three ways to collect two acorns of different species.

Or there are six ways to collect two acorns of different species if the order of how you pick them up matters.

Q4 What is the probability that the acorn in your *left pocket* is *Q. alba*?

$1/3$

Q5 What is the probability that the acorn in your *right pocket* is *Q. macrocarpa*?

$1/3$

Q6 If you already know that the acorn in your left pocket is *Q. alba*, what is the probability that the acorn in your *right pocket* is also *Q. alba*?

$1/3$

Q7 What is the probability that both acorns are *Q. rubra*?

$1/9$

Q8 What is the probability that you collected exactly one each of *Q. alba* and *Q. rubra*?

$2/9$

Q9 What is the probability that the acorn in your *left pocket* is *Q. alba* and you have an acorn of *Q. rubra* in your *right pocket*?

$1/9$

Q10 Consider a Poisson distribution with $\lambda=6$

Which of the following is the size of the sample space of this distribution?

8

- 10
- 11
- 0
- 2
- 6
- ∞

Q11 Consider a Binomial distribution with $n=10$ and $p=0.6$
Which of the following is the size of the sample space of this distribution?

11

- 10
- 11
- 0
- 2
- 6
- ∞

Q12 Which common characteristics of the Binomial and Poisson distributions make them good models for counts?

They are discrete models which use whole integers unlike other continuous distribution models which use all real numbers.

Q13 Describe a scenario in which a Binomial distribution may be a better count model than a Poisson distribution.

A binomial distribution is better when you have a fixed number of trials and only two possible outcomes: success or failure. A binomial distribution is a better count model than the Poisson distribution when looking at presence or absence. For instance, if I am at a sampling site and all I want to know is if there are a certain plant species present, I would use the binomial distribution. If I wanted to see how many of individuals were present at the site, then I would use the Poisson distribution. Additionally, the binomial distribution is appropriate when looking at proportions.