



**Resource 1:** Gangel, A. (2011), "The Sun hasn't fallen from the Sky", Bloomsbury Publishing, London.  
ISBN-10: 1408807432, ISBN-13: 978-1408807439

This semi autobiographical book is about a girl from a troubled background in Glasgow whose music teacher recognises her music talent and inspires her and supports her journey of learning and development from state school and onwards to a specialist school. Her socio-economic background is very different from that of the other students and causes her problems in fitting in. She succeeds, however, and eventually becomes the head of music at a school in Newcastle.

## The awesome seed



## Classroom resources

**Resource 2:** Images and information about seeds from plants that are important in various Christian contexts

Germination is the process in which a plant emerges from a seed. Germination results in the formation of a seedling. After a mature plant produces its seed the seed may go through a dormancy period (with no active growth) until the environmental conditions become favourable for growth. Water, temperature, oxygen and light are the main factors that affect seed germination. Most seeds require humidity to germinate. Most seeds also require oxygen to germinate, so if they are buried too deep in the soil or if the soil is too wet the seeds may not get the oxygen they require. Some seeds need to be in the light (surface sown) or in the dark (sown deep enough to receive little or no light) to germinate.

Many seeds germinate best at certain temperatures, some will germinate at a comparatively wide range of temperatures, yet others need fluctuating temperatures. Almost all seeds are waiting in a dormant state for some outside stimulus to break their dormancy, some just need sufficiently high humidity, others need scarification (a breaking of the hard seed coat), vernalisation (be exposed to the prolonged cold of winter) or to be passed through the intestines of an animal.

**Religious links:** The mustard seed is used by Jesus in the parable of the Mustard Seed as a model for the kingdom of God which initially starts small but grows to be the biggest of all garden plants.

**Germination & growth requirements:** For best growth the Black mustard (*Brassica nigra*) seeds need a well drained soil with high levels of organic matter, in temperatures between 0-24 oC. Black mustard is an easily grown plant suited to many types of soils, light (sandy), medium (loamy) and heavy (clay) soils and requires well drained soil. It can grow in semi-shade or no shade and requires moist soil. Also the plant can tolerate maritime exposure. It is often grown in temperate zones but it grows best in tropical areas.



Black mustard seed (*Brassica nigra*).  
By Sanjay Acharya



Black mustard plant (*Brassica nigra*).  
By Jennifer Anderson @ USDA-NRCS  
PLANTS Database



**Religious links:** When the angel Gabriel announced to a virgin called Mary, that she would conceive and become the mother of Jesus the Son of God, he also offered her a lily (*Lilium candidum*). The Madonna Lily symbolizes purity for Catholics.

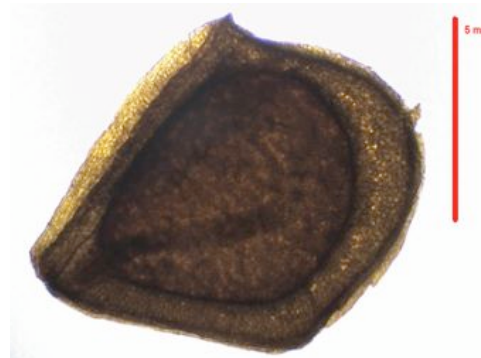
**Germination and growth requirements:** The Madonna Lily (*Lilium candidum*) requires cool temperatures during germination and frequently fails to germinate immediately if the seed is sown late, when soil temperatures are high. In order to grow the Madonna Lily prefers an open well-drained fertile loamy soil. It can grow in semi-shade or no shade. It requires moist soil.



The Madonna Lily (*Lilium candidum*).  
By Ettore Balocchi



Annunciation by Paolo de  
Matteis (1712)



The Madonna Lily (*Lilium candidum*) seeds.  
By Dr. Markus HOHENEGER,  
[www.the-genus-lilium.com](http://www.the-genus-lilium.com)

## The awesome seed



## Classroom resources

**Religious links:** In the Old Testament (the book of Ruth) there is a story about Ruth who works in Boaz's barley field to support her mother-in-law. There she meets the wealthy landowner, who admires her loyalty to her family. Eventually, Ruth and Boaz marry. King David, Mary, Joseph and Jesus are among their descendants.

**Germination and growth requirements:** There are many varieties of barley (*Hordeum vulgare*), which can be classified as either a spring or winter type. Winter types require a cold period in order to produce flowers and set seeds, and they are planted in the fall. Spring types do not require this cold period, and for best production they are planted as early in spring as the soil allows. Barley can be grown on many soil types including well drained, fertile loams and lighter clay soils. It tolerates loamy to heavy soils but will not do well in waterlogged soils. It has very good heat and drought tolerance, making it a valuable plant for semiarid areas. Barley is also the most salt-tolerant among cereal crops. It thrives in cool, dry conditions. Barley likes to grow under cool conditions but is not particularly winter hardy.



Barley (*Hordeum vulgare*).  
By Lucash



Barley (*Hordeum vulgare*) seeds.  
Steve Hurst @ USDA-NRCS PLANTS Database



Ruth in Boaz's Field by Julius Schnorr von Carolsfeld (1828), National Gallery, London.



# The awesome seed

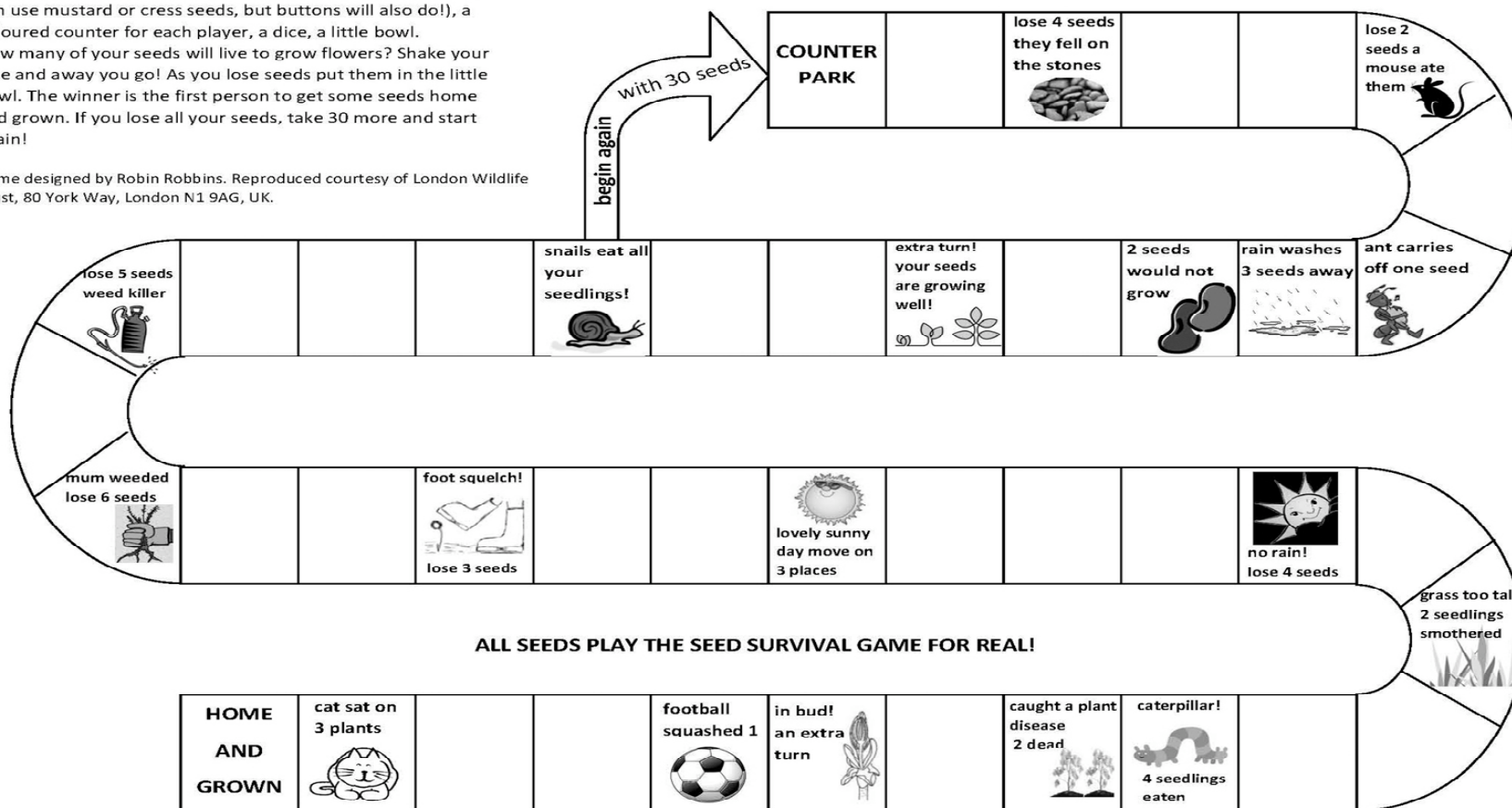


## Classroom resources

### THE SEED SURVIVAL RACE

How many seeds are there in a poppy head? Count them on sand paper to stop them rolling about! Why so many? Play the Seed Survival Race and find out! You need: 30 "seeds" each (you can use mustard or cress seeds, but buttons will also do!), a coloured counter for each player, a dice, a little bowl. How many of your seeds will live to grow flowers? Shake your dice and away you go! As you lose seeds put them in the little bowl. The winner is the first person to get some seeds home and grown. If you lose all your seeds, take 30 more and start again!

Game designed by Robin Robbins. Reproduced courtesy of London Wildlife Trust, 80 York Way, London N1 9AG, UK.



ALL SEEDS PLAY THE SEED SURVIVAL GAME FOR REAL!

## The awesome seed



## Classroom resources

### Web links to download the pictures included in 'The awesome seed' lesson resources:

#### **Black mustard seed (*Brassica nigra*)**

<http://en.wikipedia.org/wiki/File:Black-mustard-seeds.jpg>

#### **Black mustard plant (*Brassica nigra*)**

[http://plants.usda.gov/java/largeImage?imageID=brni\\_002\\_avp.tif](http://plants.usda.gov/java/largeImage?imageID=brni_002_avp.tif)

#### **The Madonna Lily (*Lilium candidum*)**

[http://en.wikipedia.org/wiki/File:Liliaceae\\_-\\_Lilium\\_candidum-1.jpg](http://en.wikipedia.org/wiki/File:Liliaceae_-_Lilium_candidum-1.jpg)

#### **The Madonna Lily (*Lilium candidum*) seeds**

[http://www.the-genus-lilium.com/images/Lilium/candidum\\_seed02.jpg](http://www.the-genus-lilium.com/images/Lilium/candidum_seed02.jpg)

#### **Annunciation by Paolo de Matteis (1712)**

[http://en.wikipedia.org/wiki/File:Paolo\\_de\\_Matteis\\_-\\_The\\_Annunciation.jpg](http://en.wikipedia.org/wiki/File:Paolo_de_Matteis_-_The_Annunciation.jpg)

#### **Barley (*Hordeum vulgare*)**

[http://en.wikipedia.org/wiki/File:Barley\\_in\\_Slovenia.jpg](http://en.wikipedia.org/wiki/File:Barley_in_Slovenia.jpg)

#### **Barley seeds (*Hordeum vulgare*)**

[http://plants.usda.gov/java/largeImage?imageID=hovu\\_002\\_ahp.tif](http://plants.usda.gov/java/largeImage?imageID=hovu_002_ahp.tif)

#### **Ruth in Boaz's Field by Julius Schnorr von Carolsfeld (1828)**

[http://upload.wikimedia.org/wikipedia/commons/3/35/Julius\\_Schnorr\\_von\\_Carolsfeld\\_-\\_Ruth\\_im\\_Feld\\_des\\_Boaz.jpg](http://upload.wikimedia.org/wikipedia/commons/3/35/Julius_Schnorr_von_Carolsfeld_-_Ruth_im_Feld_des_Boaz.jpg)

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