# M1.10 – Understanding measures of dispersion including standard deviation and range

### Quiz

1. Below are the ages (in months) of Queen ants of the genus *Cardiocondyla* from two geographically isolated populations. For each population a random sample of 11 queens was taken and the ages recorded. Calculate the mean age and standard deviation for queens from each population. Which of these two populations has the smallest standard deviation?

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Queen ant** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| Queen age in months | Population **A** | 6 | 8 | 10 | 8 | 9 | 6 | 7 | 12 | 14 | 11 | 9 |
| Population **B** | 8 | 8 | 9 | 14 | 16 | 9 | 15 | 13 | 12 | 11 | 8 |

Based on these samples we estimate the means and standard deviations for queen ages in the two populations to be:

Popn **A** , Mean = 9.1 months, S.D. = 2.5 months

Popn **B**, Mean = 11.2, months S.D. = 3.0 months

Popn **A** has the smaller standard deviation

1. The vertical jump height (mm) was measured of two separate populations (A & B) of fleas. Below are two histograms of the distributions of jump heights in the two populations. Both populations had a normal distribution around a common mean jump height of 100mm. Which population has the greatest standard deviation?

A)

B)

Population B has the greatest spread of data around the mean, and therefore will have a higher standard deviation

### Produced in collaboration with the University of East Anglia

**OCR Resources**: *the small print*OCR’s resources are provided to support the delivery of OCR qualifications, but in no way constitute an endorsed teaching method that is required by the Board, and the decision to use them lies with the individual teacher. Whilst every effort is made to ensure the accuracy of the content, OCR cannot be held responsible for any errors or omissions within these resources.   
© OCR 2017 - This resource may be freely copied and distributed, as long as the OCR logo and this message remain intact and OCR is acknowledged as the originator of this work.

OCR acknowledges the use of the following content: n/a

Please get in touch if you want to discuss the accessibility of resources we offer to support delivery of our qualifications: [resources.feedback@ocr.org.uk](mailto:resources.feedback@ocr.org.uk)

We’d like to know your view on the resources we produce. By clicking on ‘[Like](mailto:resources.feedback@ocr.org.uk?subject=I%20liked%20the%20A%20Level%20Biology%20Maths%20resource%20M1.10%20Text%20Tutorial)’ or ‘[Dislike](mailto:resources.feedback@ocr.org.uk?subject=I%20disliked%20the%20A%20Level%20Biology%20Maths%20resource%20M1.10%20Text%20Tutorial)’ you can help us to ensure that our resources work for you. When the email template pops up please add additional comments if you wish and then just click ‘Send’. Thank you.

If you do not currently offer this OCR qualification but would like to do so, please complete the Expression of Interest Form which can be found here: [www.ocr.org.uk/expression-of-interest](http://www.ocr.org.uk/expression-of-interest)

Looking for a resource? There is now a quick and easy search tool to help find free resources for your qualification:   
[www.ocr.org.uk/i-want-to/find-resources/](http://www.ocr.org.uk/i-want-to/find-resources/)

This resource has been produced as part of our free A Level teaching and learning support package. All the A Level teaching and learning resources, including delivery guides, topic exploration packs, lesson elements and more are available on the qualification webpages.

If you are looking for examination practice materials, you can find the Sample Assessment Materials (SAMs) on the qualification webpages: [Biology A](http://www.ocr.org.uk/qualifications/as-a-level-gce-biology-a-h020-h420-from-2015/) / [Biology B](http://www.ocr.org.uk/qualifications/as-a-level-gce-biology-b-advancing-biology-h022-h422-from-2015/)