# Touch&Learn

STEM project:

To learn math and science concepts using migratory birds as a learning paradigm.

The European Crane: it flies over north of Europe.

<http://birding140.es/las-grullas-europeas-su-increible-viaje-desde-escandinavia-hasta-espana/>

- common name: European Crane

- scientific name: Grus Grus

- social organization:

The common crane is a fairly social bird while not breeding. Flocks of up to 400 birds may be seen flying together during migration. Staging sites, where migrating birds gather to rest and feed in the middle of their migration, may witness thousands of cranes gathering at once. However, the flocks of the species are not stable social units but rather groups that ensure greater safety in numbers and collectively draw each other's attention to ideal foraging and roosting sites.[[7]](https://en.wikipedia.org/wiki/Common_crane#cite_note-Bautista1995-7) Possibly due to a longer molt, younger and non-breeding cranes are usually the earliest fall migrants and may band together at that time of year. During these migratory flights, common cranes have been known to fly at altitudes of up to 33,000 ft (10,000 m), one of the highest of any species of bird, second only to the [Ruppell's Griffin Vulture](https://en.wikipedia.org/wiki/Ruppell%27s_Griffin_Vulture).[[8]](https://en.wikipedia.org/wiki/Common_crane#cite_note-8)

Cranes use a kleptoparasitic strategy to recover from temporary reductions in feeding rate, particularly when the rate is below the threshold of intake necessary for survival.[[9]](https://en.wikipedia.org/wiki/Common_crane#cite_note-Bautista1998-9) Accumulated intake of common cranes during daytime at a site of stopover and wintering shows a typical anti-sigmoid shape, with greatest increases of intake after dawn and before dusk.[[10]](https://en.wikipedia.org/wiki/Common_crane#cite_note-Bautista2013-10)

Didactic Material:

* Proportion sticks: use laser cutting machine for make simple sticks, follow instructions provided on “Laser Cutting” folder
* Magnetic lines: use magnetic tape to make your own “magnetic lines”. Cut them to the length you want
* Magnetic Grid: use laser cutting machine for make a simple grid you can use as cartesian plane. Use the Braille Letters for labeling. Follow instructions provided on “Laser Cutting” folder
* DeciGrid: The DeciGrid is a pad with a grid of little bumps that fits inside the spaces of Magnetic Grid. Each bump of DeciGrid represents a decimal place between the unit space represented by each square on Magnetic Grid. Use DeciGrid for precise positioning on cartesian plane. 3D print the DeciGrid as is explained on “3D Models” folder
* Pocket Braille Printer: Pocket Braille Printer have interchangeable typos for create your own material printed on Braille. 3D Print all parts and assembly as is explained on “3D Models” folder.
* Crane Mural: How blind children can imagine the crane in migration formation?
  + Use laser cut for make silhouettes of flying cranes and stick on a wall
* Crane Book
  + Page 1: Names of the crane (common and scientific)
  + Page 2: Size of the crane. Use the size of crane compared with the size of a man to explain proportions by “proportion sticks”. You can use “unit sticks” to explain concepts as addition, subtraction, multiplication and division. For more complex multiplications use the Mayan method (Tzeltal Multiplication or Japanese Method: https://www.youtube.com/watch?v=bbKjXKV9QNA) by “magnetic lines”.
  + Page 3: Migration routes. Use the migration routes for explain the concept of lines on a cartesian plane (use “magnetic lines” and “magnetic grid” and “DeciGrid”
* Braille Letters: use the magnetic Braille Letters for explain the form of common writing letters and concept of quantity.
* Pocket Braille Printer: use the Pocket Braille printer for print cards for labeling and produce your own material for blind children.

1. The Migration of European Crane: Image of cranes
2. Scientific name: Grus Grus, Image of cranes
3. Dimensions
4. Cranes migrating: formation. Why cranes migrate? when days are shorter a biological clock give the signal to migrate to warmer zones where the days are longer. Longer days means more opportunities to feed and reproduce.
5. Cranes migrate on november from Scandinavia to spain. This is a 4000 km trip. That's equivalent to asking the entire population of Hamburg to lie on the ground to form a row one after another
6. The common cranes fly at altitudes of up to 10000 m, similar to altitudes of commercial planes