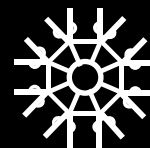


Building Machines with K'NEX (1)



Why build machines with K'NEX?

There are four reasons to build machines with K'NEX:

- K'NEX is more than an easy-to-use construction kit – it is a true structural and mechanical engineering system, which is ideal for building both vehicles and static machines.
- Building and testing working machines with K'NEX therefore gives students a valuable educational experience
- There are a number of K'NEX sets based on machines, with comprehensive instruction books that make building them easy for beginners
- Building machines with K'NEX is great fun!

Who might enjoy building them?

In our experience, the following will enjoy and benefit from building machines with K'NEX:

- ✓ **Primary Schools**
- ✓ **Secondary Schools**
- ✓ **Children's clubs**
- ✓ **Childcare schemes**
- ✓ **Family Learning programmes**
- ✓ **Post-16 education**
- ✓ **Adult Education**

What K'NEX will I need?

If you already have a medium-sized K'NEX set, then you probably have enough K'NEX to start building machines. Our website www.knexusergroup.org.uk includes photos of models to build in the "Models to build" section, and K'NEX challenges in the "Challenges" section.

If you need more K'NEX, or if you want to build K'NEX machines from comprehensive instructions, then we would recommend buying one or more of the "Introduction to Simple Machines" sets or the Discovery Building set shown opposite.

If your students are already experienced with K'NEX, and are looking to build more sophisticated machines, we would recommend the larger sets shown overleaf.

Can all ages of student build machines?

The simplest machines, such as those in the Discovery Building set, can be built by 5-6 year olds (KS1). The "Introduction" sets are ideal for children aged 7+ (lower KS2), and the larger sets overleaf for children aged 9+ (upper KS2 and KS3).

What skills will be learned?

The best way to build K'NEX machines is for students to work in pairs or small groups. The skills they learn will then include:

1. An understanding of how machines work - an important part of the Design and Technology curriculum from KS1 to KS3.
2. Hands-on experience of how Forces operate, which is part of the Science Curriculum at KS1 to KS3.
3. Team-working skills.
4. Problem-solving skills.
5. Communication skills.
6. Self-esteem.

Training workshops

It is not essential for teachers and tutors to complete a training workshop before they start building K'NEX machines with their students. However, if you are interested, we have the following available:

- "Building Machines with K'NEX" training workshop for your staff.

K'NEX machines sets and guides

There are 12 K'NEX machines sets and 3 guides available. These can be purchased via the K'NEX on-line shop on our website www.knexusergroup.org.uk

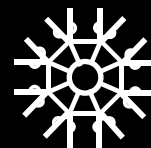
K'NEX Simple Machines sets



There are four sets that are ideal for introducing different aspects of simple machines to students, namely:

- Intro.to Simple Machines: Gears set
- Intro.to Simple Machines: Levers and Pulleys set
- Intro.to Simple Machines: Wheels, Axles & Inclined planes set
- Discovery Building set

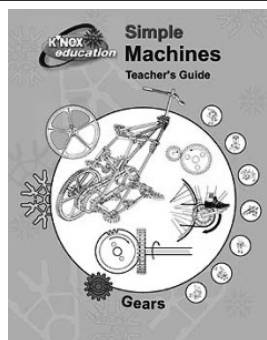
Building Machines with K'NEX (2)



Curriculum Guides

Each of the "Intro.to Simple Machines" sets shown on the previous page includes a free UK curriculum Guide, on CDROM.

The Guides contains a wealth of information for teachers, including comprehensive lesson plans.



Larger K'NEX sets for building machines

The following larger sets are available for building machines with K'NEX:



- Forces, Energy and Motion set
- Transportation set
- Motorised Simple Machines set
- Exploring Machines set
- Solar energy set (see photo opposite)
- Roller Coaster Physics set (pictured above)
- Amusement Park Experience set
- Simple Machines deluxe set

Comments on sets from teachers and tutors

The following are some comments on the "Introduction" sets from the teachers and tutors who have attended our training workshops.

"Good – very educational and enjoyable."

"Great – plenty of ideas for the classroom."

"Very useful, simple to use – not too many different pieces."

"Good – surprising how much can be done with a relatively small amount of equipment."

"There are clearly endless possibilities."

"Very good indeed."

"Can't wait to try this out."

A typical K'NEX simple machines project

A typical project using the Introduction to Structures: Gears set might proceed as follows, with students working in pairs to:

1. Look at photos of some electric fans (either printed photos or on the internet).
2. Build the basic cranked fan from the instructions provided in the set.
3. Test the fan, and then change the sizes of gear wheel used, to make the fan go faster and slower.
4. Think of ways to make the fan create a greater air flow, for instance by attaching aerofoils made of thin card to the blades.

A K'NEX "Great Book Race" challenge

In addition to building machines from instructions, students who are already familiar with K'NEX will enjoy completing K'NEX challenges. An example is the K'NEX "Great Book Race" challenge, in which students build a vehicle to their own design, without instructions.

You can find full details of the challenge on the "challenges" page of our website www.knexusergroup.org.uk There are three levels of difficulty:

Level 1 Make a vehicle that will carry a paperback book

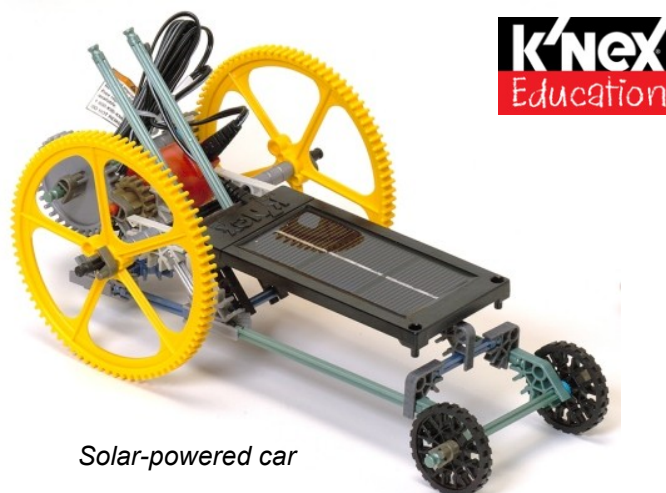
Level 2 As level 1, with a motor

Level 3 As level 2, that will carry the book right across a room

Less experienced students will be able to complete level 1 with a little help. More experienced students can then go on to complete levels 2 and 3 if they wish.

K'NEX challenges are particularly good at helping students to develop their problem-solving skills.

If you have any questions about Building Machines with K'NEX, please email us on: info@knexusergroup.org.uk



Solar-powered car