

## Something to make

### Dice problems

*Have fun making three dice and trying out some problems.*

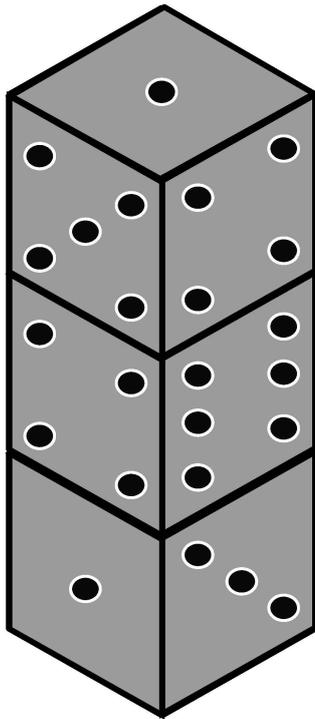
**You will need:** Dice nets, paper and pencil

**First, follow the instructions to assemble your 3 dice.**

When you have made the dice, look at the **opposite** faces of one of them.

What do you notice about the **opposite faces**?

Use what you have found out to help solve this problem:



Make a tower of your **3 dice**, as shown.

There are five hidden numbers: the bottom of the top dice, and the top and bottom of the other two. We can't see them, without turning the tower around, but all other numbers **are** visible.

Now, see if you can write down the numbers that are hidden.

Do they add to 20...?

Now ask someone to make another tower.

Tell them you can quickly add the five numbers that you can't see!

*Quickly multiply 7 by 3 and subtract the top number. That will always give you the answer! Can you see and explain why?*

**Challenge** You can try this with a tower of four dice. This time, the total of the hidden numbers will be 4 times 7, minus the top number! Try with bigger towers.

Now try these two dice 'tricks':

### Galloping dice

Ask someone to **roll two dice** while your back is turned and add the **2 numbers**.

They choose **one** of the dice and **add the number on the bottom** of it to their **total**.

They roll that one again and add the number to the total and write it down.

**You then turn around; add the 2 dice you can see and add 7.** That will be **their total!**

**Here's an example:** Your friend rolls a **2** and a **6**, totalling 8. Choose the 6, so add **1** (the number on the bottom) making **9** as the running total. Roll the 6 again and get a **3** making **12** as the running total.

You turn around and can see a 3 and a 2... Add those (5) and **7** makes 12!

### Mind reading

Ask someone to **roll three dice** while your back is turned.

They look at the **first dice**, double it and add 3, then multiply by 5.

They then add the number on the **second dice** and multiple the total by 10.

They then add the number on the **third dice** and tell you the total.

**Ask them for the total (still without looking at the three dice) and subtract 150, the 3 digits of the answer will give you the three dice numbers in order!**

**Here's an example:** Your friend rolls a **2, 4** and **3**.

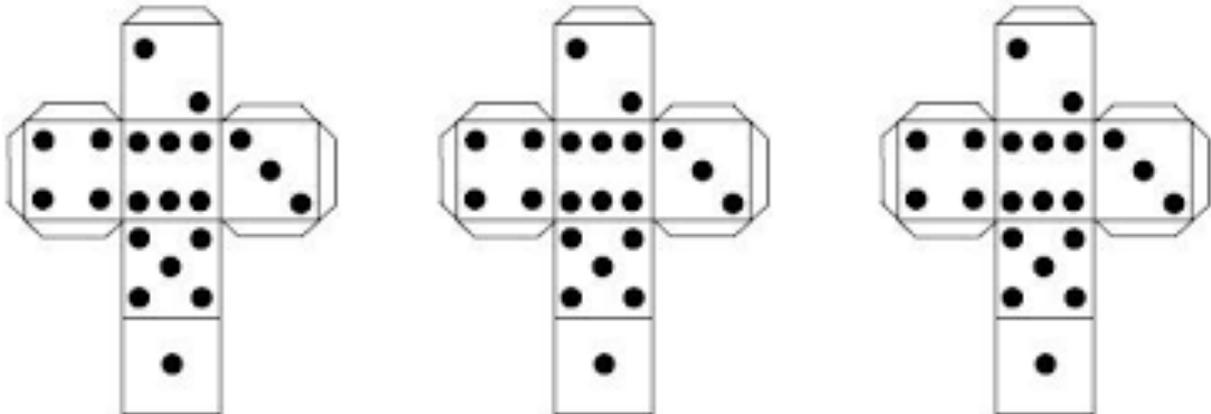
Double 2 is **4**, add 3 is **7**, 7 multiplied by 5 is **35**.

Add the second dice, 4, giving 39 and multiply by 10 makes 390.

Add the third dice, 3, giving 393.

**Subtracting 150 from 393 leaves 243**, the three digits on the dice originally rolled!

## Dice nets



### Making the dice

If possible, print these model templates on cardboard or thick paper but they can also be printed on normal paper, they just may be a bit "floppy".

If you print on normal paper, you could then glue them onto a sheet of card, or just use the paper template as a guide for cutting the cardboard.

After cutting out the shapes fold neatly.

To make folding easier with card, you can *score* along the lines before folding.

After folding, carefully glue the tabs one at a time.