Centre of the Cell

Designing Interactives

A cross-curricular activity

This activity focuses on the games themselves, in particular the process of designing and building them. It covers aspects of Computer Science, Media Studies and English.

The design process

Our games – those in the Pod and those on the website – were all designed via the process shown in Figure 1.

All of these steps ensure that the finished interactive is not only fun and interesting, but fulfils the learning aims set for it. Much of this happens via the presentation: animations that draw the attention, particular colour cues for particular sections of text.

Activity

This activity refers to the original development documentation for the Organ Surgery game (www.centreofthecell.org/interactives/organsurgery/), reproduced below. It will encourage students to think about the decisions made in the design process, using our own archives as reference. Students can then design their own game, bearing in mind what they have learnt from our mistakes.

- If the students are not familiar with the basics of the design process, introduce it to them using the flow-chart above. If they are familiar, you need only relate the process of interactive design to what they know already.
- Show students the example treatment (page 7), wireframe slide (page 9) and final game (page 10 and online) for Organ Surgery. Ask them to find differences between the wireframe slide and the finished game. What has been changed? Why were those decisions taken? Why, for example, was the amount of text reduced for the final version?
- Look back at the original brief: several changes have been made from the original suggestions. Most importantly, the premise of the game no longer based on a Frankenstein concept, neither is it as gory as was first agreed. Why would these decisions have been taken? At what stage in the process would this have changed?

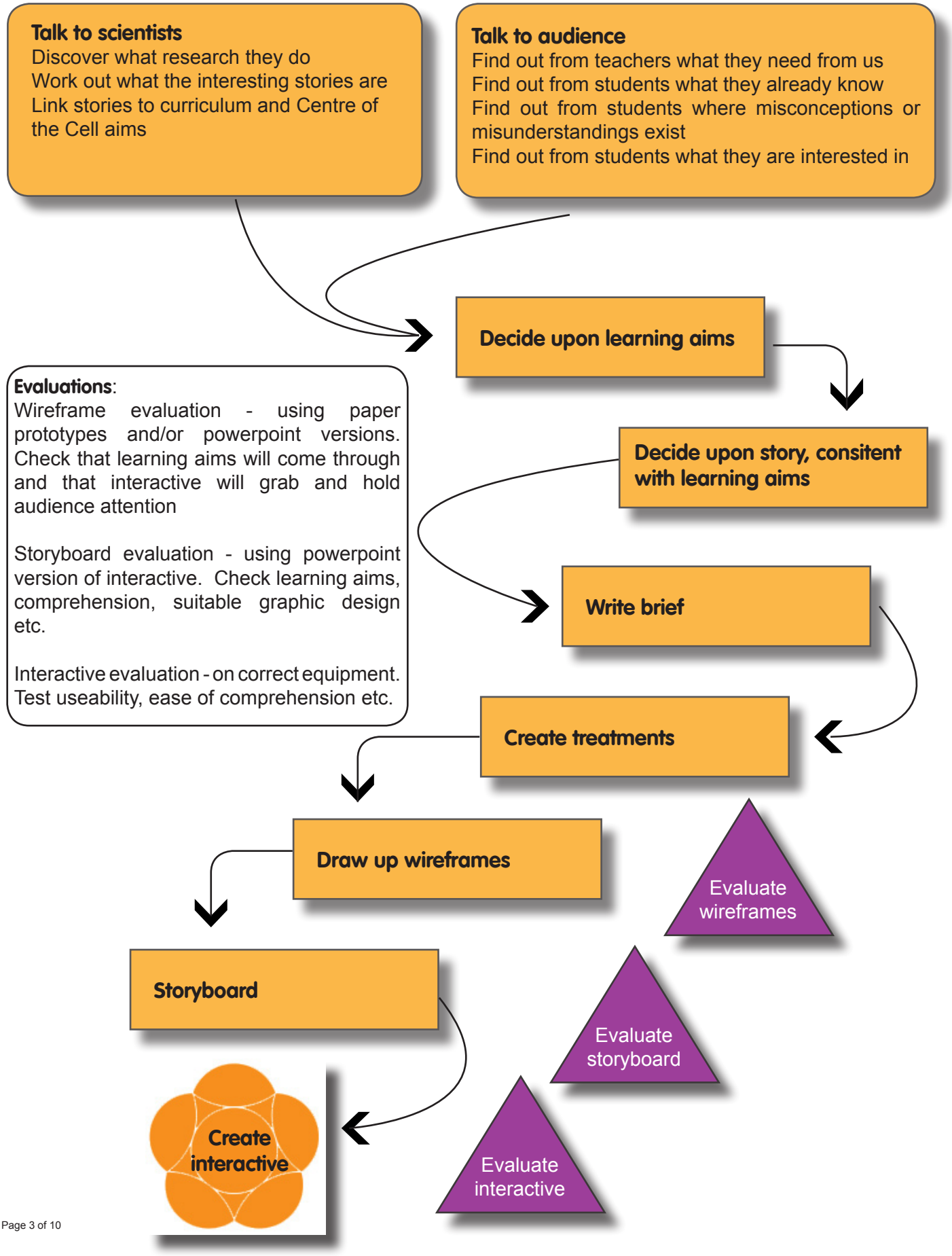
- Ask them to design their own game, singly or in groups, based on a science topic of their choice. Explain that it must be aimed at an audience younger than themselves. If they cannot think of a topic they would like to use (it is often helpful to ask them to think back to a subject they had trouble with when they were younger) suggest some examples. Themes that work well include the rock cycle, the water cycle, and electrical circuits.

- When they visit the Pod, ask pupils to look out for the language, animation and graphical choices made by Centre of the Cell designers. Ask them to think about why those choices may have been made.

Further work

Depending on the background and ability of the group, it may be useful to run this as a longer-term project, with a completed flash game as the end product.

Figure 1 - Flowchart showing the design process for Centre of the Cell interactives



Original Brief (2006)

Plasma screen P12: Touchscreen Interactive Web/Pod
Working Title: Organ Surgery
Target audience: KS2

Outline of game

A Frankenstein game, based on the idea that there is a body of a person that has had all of its internal organs removed and the player needs to put the organs back into the body, firstly to get each individual body system working and finally to make the whole body work. This game could be a beat-the-clock activity. The game should be gory with lots of blood. The player needs to have the feeling that they are performing surgery. The scene could be set on a surgical table, with green gowns and surgical instruments. If they get the task wrong then there are funny consequences – the body malfunctions or makes strange noises. If they get the tasks right they sew up the body and the patient comes to life.

Learning aims
Level 1
- to name the major body organs
- know where they are in the body

Level 2
- what other organs they are linked to form organ systems

Level 3
- Understand that each organ system is involved in a set of functions

Science Facts
Examples of the body systems are as follows:-

What do I need to move?

System **Level 1 message**	**Major Structures** **Level 2 message**	**Functions** **Level 3 message**
Skeletal system	bones cartilage tendons ligaments and joints	they provide support and protection for internal organs
Muscular system	Muscles skeletal, (cardiac and smooth)	Provides structure moves trunk and limb (moves substances through the body)

What keeps my body free from infection?

System Level 1 message	Major Structures Level 2 message	Functions Level 3 message
Integumentary	Skin, hair and nails	Protects against pathogens (helps regulate body temperature)
Immune	Lymph nodes and vessels, white blood cells	Provides protection against infection and disease

What do I need to breathe?

System Level 1 message	Major Structures Level 2 message	Functions Level 3 message
Respiratory	Air passages, lungs	Carries air into and out of lungs, where oxygen and carbon dioxide are exchanged
Circulatory	Heart, blood vessels, blood	Transports nutrients and wastes to and from all body tissue
Muselces	Muscles (skeletal), cardiac and smooth	Moves substances through the body. (Provides structure moves trunk and limb)

What do I need to tell my body what to do?

System Level 1 message	Major Structures Level 2 message	Functions Level 3 message
Nervous	Brain, spinal cord, nerves, sense organs, receptors	Controls and coordinates body movements and senses, controls consciousness and creativity, helps monitor and maintain other body systems
Endocrine	Endocrine glands and hormones	Maintain homeostasis, regulate metabolism, water and mineral balance, growth and sexual development and reproduction

What deals with the food that I eat to give me energy?

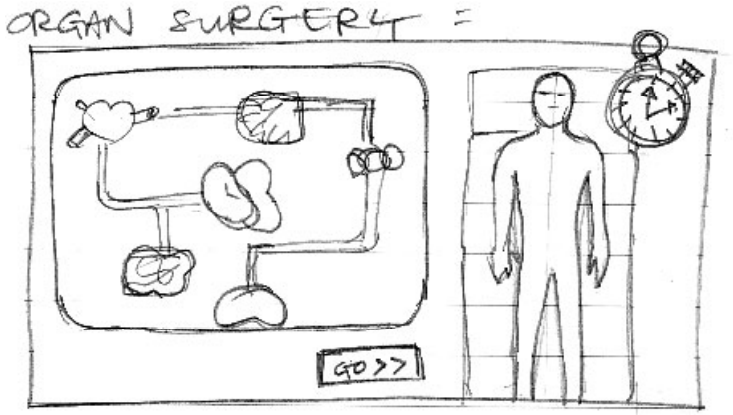
System Level 1 message	Major Structures Level 2 message	Functions Level 3 message
Digestive	Mouth, oesophagus, stomach, liver, pancreas, small and large intestines	Stores and digests food, absorbs nutrients eliminates wastes
Muscular	Muscles (skeletal), cardiac and smooth	Moves substances through the body. (Provides structure moves trunk and limb)
Circulatory	Heart, blood vessels, blood	Transports nutrients and wastes to and from all body tissue

Once the brief is finalised to everybody's satisfaction, a treatment is drawn up from the brief. The treatment that follows on the next page was drawn up by the contracted developers based on the finalised brief. This is the initial treatment for the game, showing the learning aims, a summary of the game, and a summary of the interactive component of the game.

The treatment is there to show your ideas to your colleagues, boss or sub-contractors.

Initital Treatment (March 2006)

Organ surgery (P12)
The organ systems: race against the clock



Your mission: It's a race against the clock to keep your patient alive!

VIRTUAL ORGAN SURGERY: TREATMENT

A drag and drop game with a gratuitous use of blood and gore.

This interactive explores how the major organs are connected to form organ systems.

It's similar to the Tube map, an interconnection of tissues and circulatory vessels. You need to connect them in the right order to make the person breathe and move.

The bodily systems covered include:

What do I need to move?
Skeletal and muscular systems

What do I need to make me breathe?
Respiratory, circulatory and muscular systems

What do I need to tell my body what to do?
Nervous and endocrine systems

What keeps my body free from infection?
Immune and intergumentary systems

You get a payoff each time you get it right, i.e., the person breathes, moves etc.

Action: Idea requires further development from a science perspective, to make sure the science works.

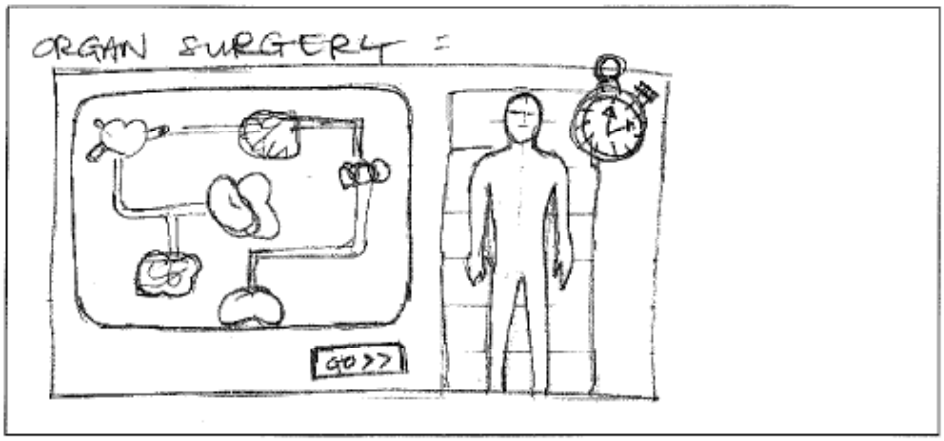
POSSIBILITIES

Major Organs
Appendix
Brain
Colon
Diaphragm
Ear
Eye
Heart
Kidney
Larynx
Liver
Lung
Nose
Pharynx
Pancreas
Skin
Small intestine
Spleen
Stomach
Tongue

Tissues
Connective tissue
Endothelial tissue
Epithelial tissue
Glandular tissue
Lymphoid tissue
etc

Edited Treatment (August 2006)

Organ surgery (P12)
The organ systems: race against the clock



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It's similar to the Tube map, an interconnection of tissues and circulatory vessels. You need to connect them in the right order to make the person breathe and move.

- Once correct the 'tube map' moves into the body in correct locations (or similar)

The bodily systems covered include:

What do I need to move?
Skeletal and muscular systems

What do I need to make me breathe?
Respiratory, circulatory and muscular systems

What do I need to ~~tell my body what to do?~~ stet
Nervous and endocrine systems

What keeps my body free from infection?
Immune and intergumentary systems

What do I need to get energy from food? Digestion system

You get a payoff each time you get it right, i.e., the person breathes, moves etc.

Action: Idea requires further development from a science perspective, to make sure the science works. – detail in brief

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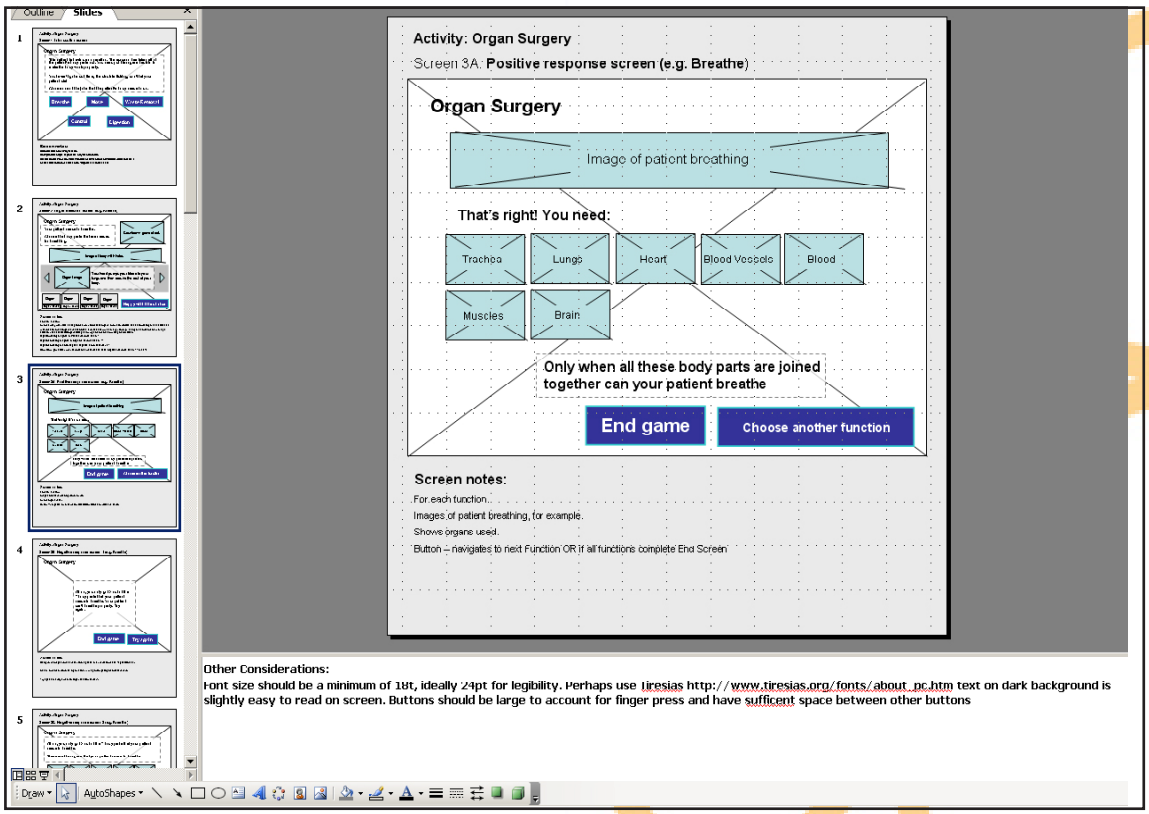
Glandular tissue
Lymphoid tissue
etc

correct details in brief

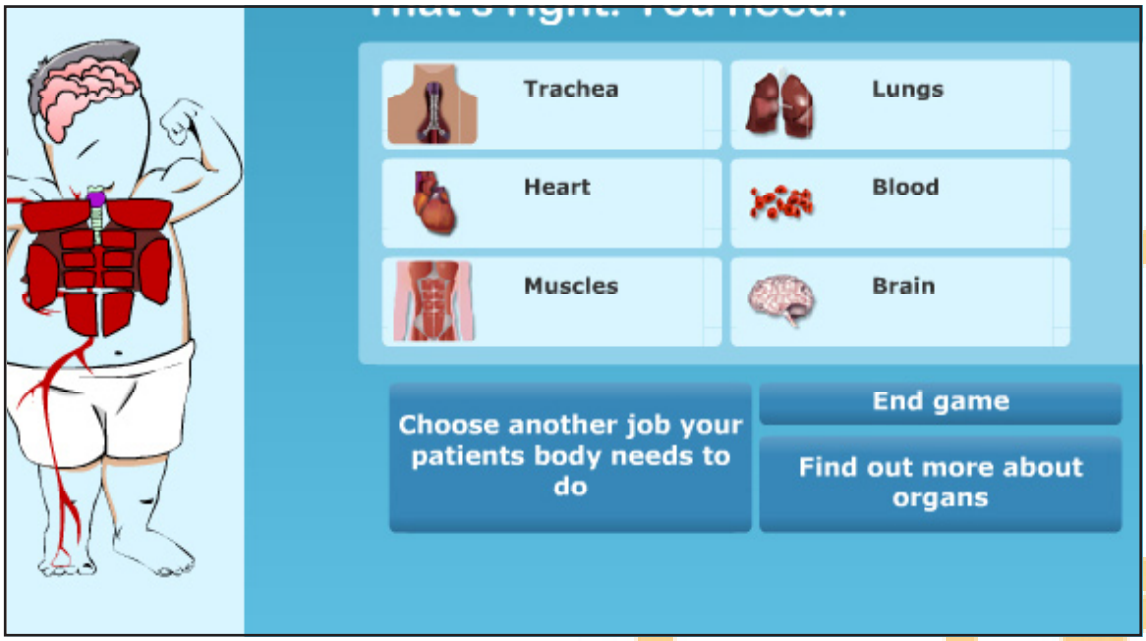
Wireframe (December 2006)

Once the basic idea of the game has been agreed upon, the wireframe is drawn up. This is comprises several different pages, each one showing the main stage of the game. The slide shown below comes on completion of the game. Note that the extra information on font size and button placement takes into account both formats of the game – a touchscreen in the pod and an online that can also be played on an interactive whiteboard.



Final game (2008)

Look back at the slide from the wireframe, above. The corresponding screen in the finished, published game looks like this:



Note that the text has been changed. In the wireframe, the message was "only when all these body parts are joined together can your patient breathe." In the finished game, it is down to four words: "That's right! You need:".

Note also that there is no 'blood vessels' tissue in the finished game, only blood itself. In the wireframe, both blood and blood vessels are required for the correct solution.