

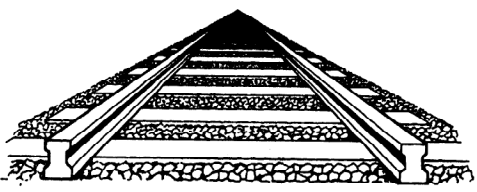
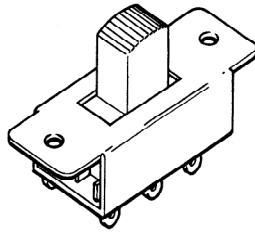
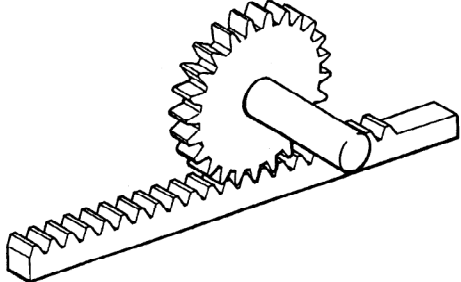
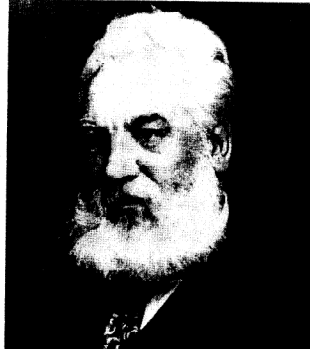
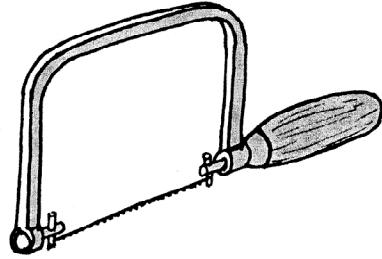
*An Roinn Oideachais agus Eolaíochta
Junior Certificate Examination, 2002*

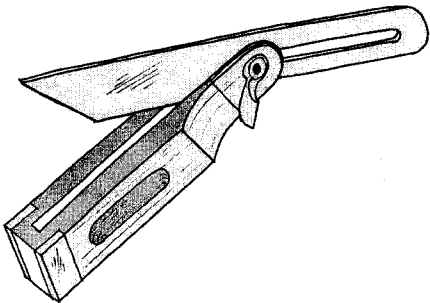
TECHNOLOGY

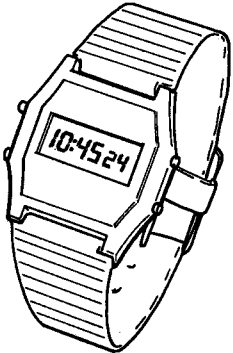
ORDINARY LEVEL

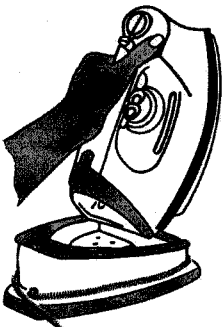
*Marking
Scheme*

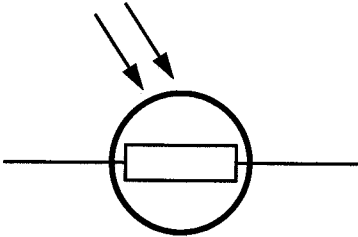
SECTION A – 80 MARKS ANSWER ANY SIXTEEN QUESTIONS FROM THIS SECTION

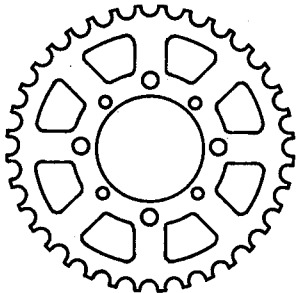
<p>1.</p> 	<p>This railway track is shown in:</p>	<p>Plan</p>	
		<p>Elevation</p>	
		<p>Perspective</p>	<p>5</p>
<p>2.</p> 	<p>This switch is a:</p>	<p>Toggle Switch</p>	
		<p>Rocker Switch</p>	
		<p>Slide Switch</p>	<p>5</p>
<p>3.</p> 	<p>This mechanism is a:</p>	<p>Cam and Follower</p>	
		<p>Worm and Worm Wheel</p>	
		<p>Rack and Pinion</p>	<p>5</p>
<p>4.</p> 	<p>Alexander Graham Bell invented the:</p>	<p>Aeroplane</p>	
		<p>Telephone</p>	<p>5</p>
		<p>Television</p>	
<p>5.</p> 	<p>This saw blade is in:</p>	<p>Tension</p>	<p>5</p>
		<p>Compression</p>	
		<p>Shear</p>	


6.		This tool is a:	Marking Gauge	
			Sliding Bevel	⑤
			Marking Knife	

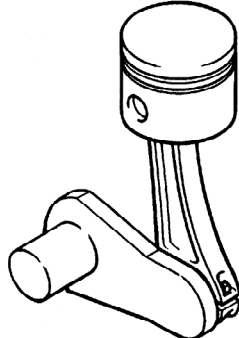
7.		The display of this watch is:	Analogue	
			Digital	⑤
			Mechanical	

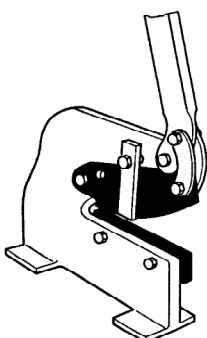
8.		The energy conversion that takes place in an electric iron is:	Electrical to Heat	⑤
			Heat to Electrical	
			Kinetic to Heat	

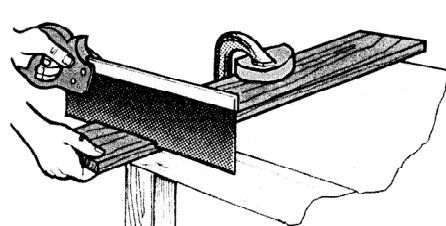
9.		This is the symbol for a:	Light Emitting Diode	
			Variable Resistor	
			Light Dependent Resistor	⑤

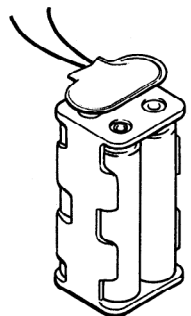
10.		This is a:	Sprocket	⑤
			Pulley Wheel	
			Cam	

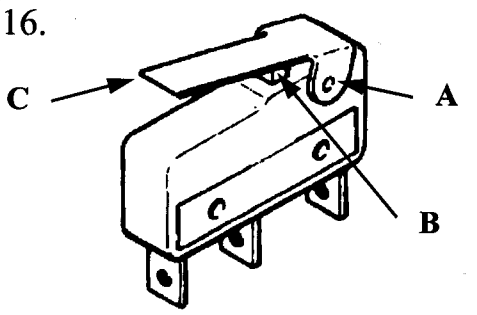
11. 	The Internet term WWW means:	Whole Wide World	
		World Wide Web	⑤
		Whole Wide Web	

12. 	The piston in an engine:	Rotates	
		Moves up only	
		Moves up and down	⑤

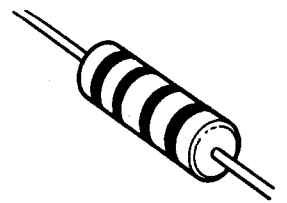
13. 	This machine is used for cutting:	Sheet Metal	⑤
		Sheet Wood	
		Sheet Acrylic	

14. 	This saw is a:	Hacksaw	
		Tenon Saw	⑤
		Scroll Saw	

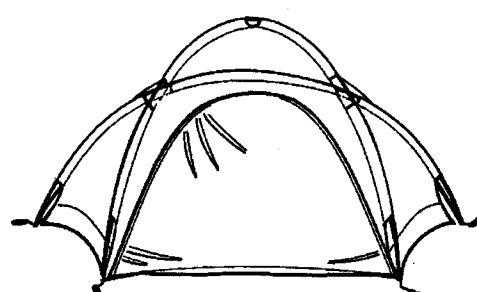
15. 	The total voltage of this battery made from 4 cells is:	6V	⑤
		3V	
		9V	

16.  The fulcrum of this lever microswitch is at:

Position A	(5)
Position B	
Position C	

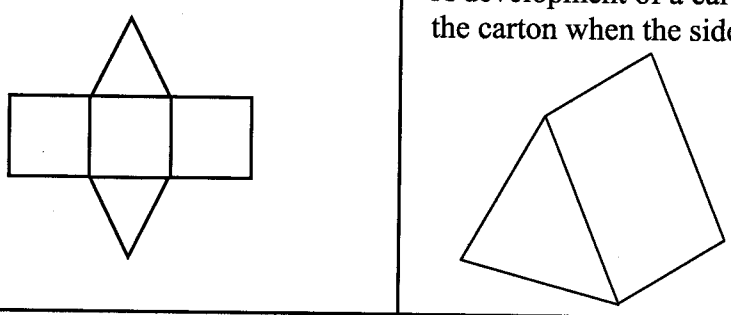
17.  The bands on a resistor indicate its value in:

Volts	
Amps	
Ohms	(5)

18.  List **two** properties of a fabric used to make tents.

Property 1: Lightweight (3)

Property 2: Waterproof (2)

19.  A development of a carton is shown. Make a 3D sketch of the carton when the sides are folded into position.

No Attempt	0	←	
Poor	1	←	
Good	3	←	→ 2
Complete	5	←	→ 4

20.

Input	Output
1	0
0	1

This truth table is for a(n):

AND Gate	
OR Gate	
NOT Gate	(5)

SECTION B – 80 MARKS
ANSWER ANY TWO QUESTIONS FROM THIS SECTION

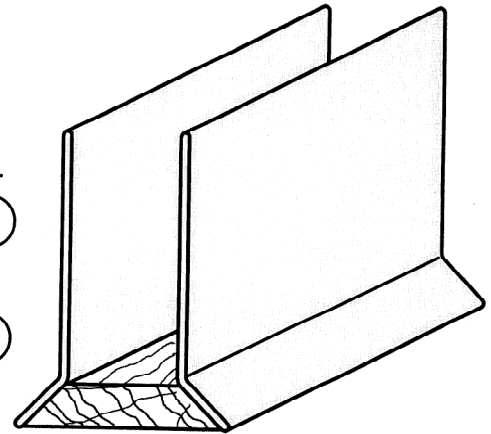
1.

40 Marks

- (a) The following brief was given to a Technology class:
 “Design and make a device for holding letters.”

10 Marks

One student designed and made the letter holder shown.



- (i) State **two** questions you would ask when evaluating the design.

1. Is this device suitable for holding letters? (2)

2. What improvements, if any, should be made? (2)

- (ii) The base of the letter holder is made from hardwood.
 Name a suitable material for the sides and give a reason for your choice.

Material: Acrylic (2)

Reason for choosing: Easily bent, available in bright colours, easily cleaned, looks good. (2)

- (iii) When in use, the letter holder was found to move too easily on the surface of a desk.
 Suggest a solution to this problem.

Solution: Fix to desk, make bigger base, use metal weights on base. (2)

- (b) Complete the elevation and end view of the letter holder on the grid below.

10 Marks

Elevation (5)	End View (5)
No Attempt 0 ← Poor 1 ← → 2 Good 3 ← → 4 Complete 5 ←	No Attempt 0 ← Poor 1 ← → 2 Good 3 ← → 4 Complete 5 ←
Elevation	End View

(c) (i) List **three** processes used in the manufacture of the sides of the letter holder.

10 Marks

1. Marking out (2)
2. Cutting (2)
3. Bending (2)

(ii) Describe with the aid of a sketch how you would carry out any one of these processes.

Name of process: Bending

Description of process: _____

Description of process. (2)

Sketch
(2)

(d) Suggest **two** ways in which the design of the letter holder can be improved.

4 Marks

1. Change the design so that it hangs on a wall. (2)
2. Make it wider to take more letters and increase stability. (2)

(e) (i) In the past, letter writing was a common means of communication.
Suggest **two** ways in which this has changed.

6 Marks

1. Email (2)
2. Mobile phones (2)

(ii) How have these changes affected our environment?

Less paper being used / Increased radiation from mobile phones. (2)

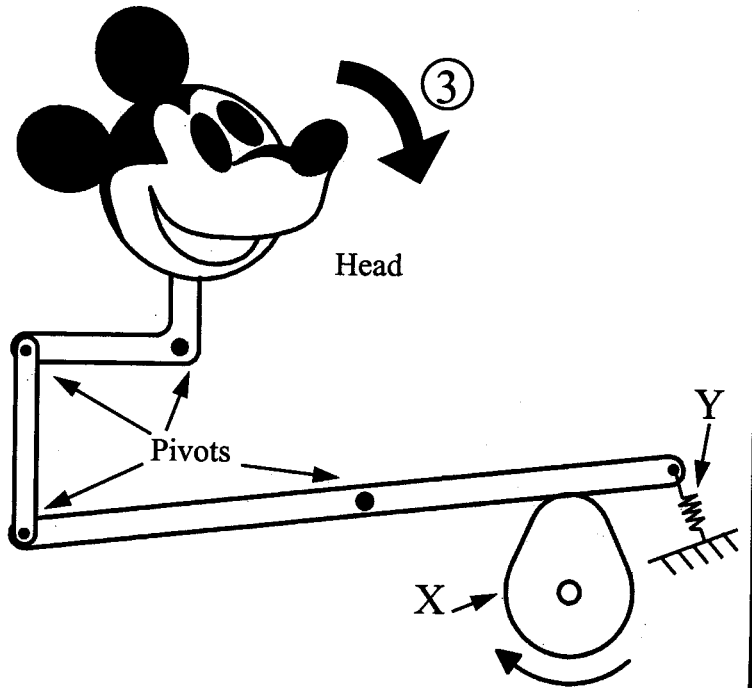
12 Marks

(a) The mechanism shown is to be used as part of a shop window display.

(i) Name mechanism 'X'.

Mechanism 'X': Cam ③

(ii) Indicate on the drawing the direction of movement of the head when mechanism 'X' rotates 90° in the direction shown.



(iii) When a motor was connected to mechanism 'X' the head of the figure moved too quickly. How can the speed of the motor be reduced?

Use a gearbox or pulley system. ③

(iv) Explain the function of Part 'Y' in the mechanism shown above.

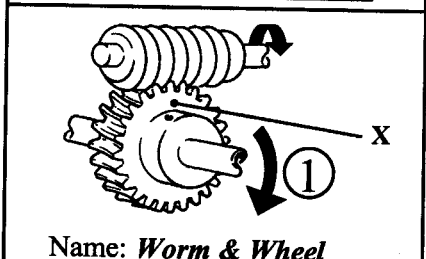
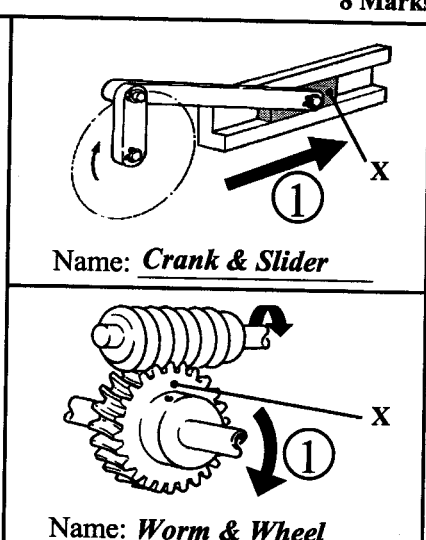
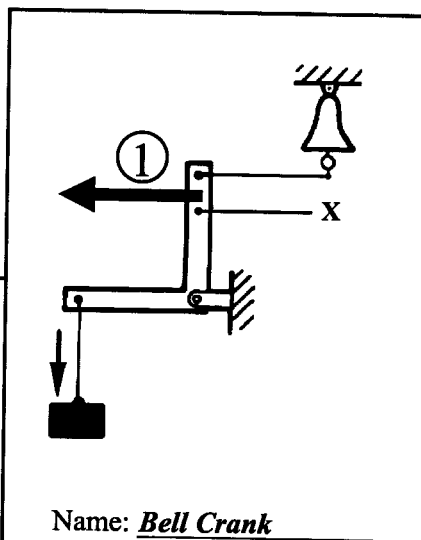
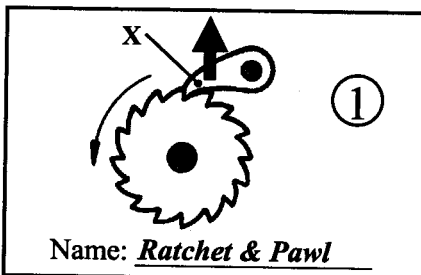
This is a spring that is used to keep the lever in contact with the cam at all times. ③

(b) (i) Indicate with an arrow the direction of movement of Part 'X' in each diagram.

8 Marks

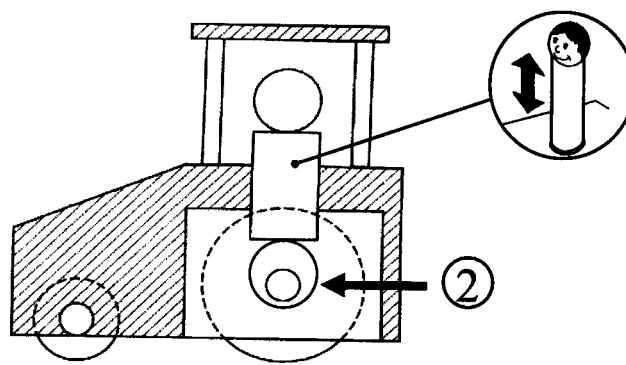
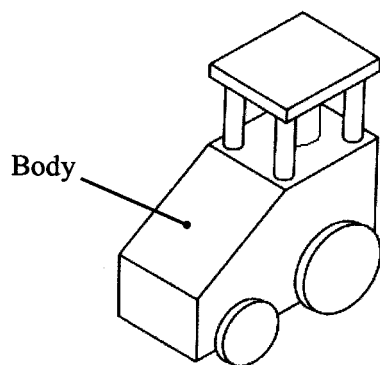
(ii) Name any two of the mechanisms.

② + ②



(c) (i) Complete the drawing by sketching a mechanism which makes the driver move up and down when the toy truck is pulled or pushed.

8 Marks



Sectioned view of truck

(ii) Give **two** safety factors that should be considered when designing a toy truck.

1. No sharp edges. (2)

2. No loose parts. (2)

(iii) The body of the truck is made from teak. Give **two** reasons why teak is a suitable material.

1. Heavy durable wood. (1)

2. Looks well when varnished. (1)

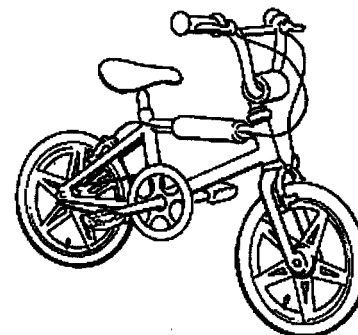
(d) (i) Bicycle frames are generally made up of triangles. Give a reason for this.

6 Marks

Reason: Makes frame stronger. (2)

(ii) When brakes are pulled on a bicycle, the brake blocks press on the rim of the wheels. Name the force that causes the wheels to stop.

Name of force: Friction (2)



(iii) Give **one** reason why rubber is used in the manufacture of bicycle tyres.

Reason: Grips road well. (2)

(e) (i) In many cities around the world people cycle to work. List **two** advantages of this.

6 Marks

1. Healthy activity. (2)

2. Reduce pollution. (1)

(ii) List **two** improvements that have taken place in the design of bicycles in recent years.

1. Made from lighter materials. (2)

2. Suspension system on mountain bikes. (1)

(a) A sketch of a toy truck is shown.

14 Marks

(i) What material would you use to make the frame of the truck?

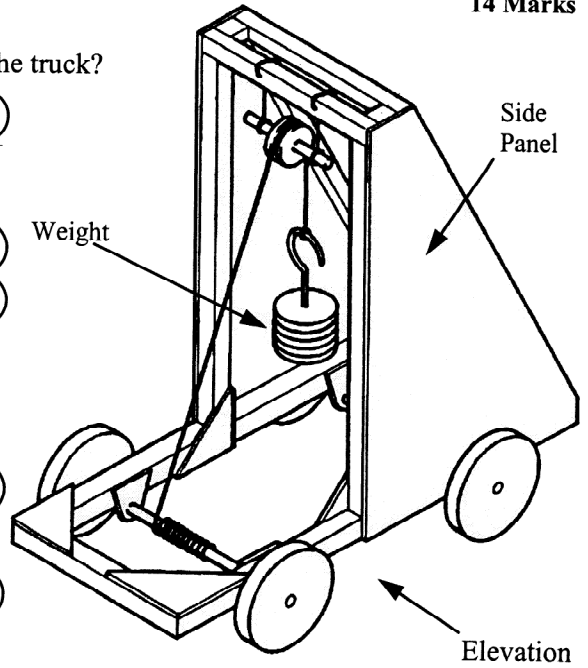
Material: Wood (2)

(ii) State **two** advantages of using this material.

1. Lightweight (2)
2. Easily cut and shaped. (1)

(iii) The side panels of the truck are to be made from acrylic. Give **two** methods of fixing the side panels to the frame.

1. Glue (2)
2. Screw (1)



(iv) Complete the elevation of the truck on the grid below.

(6)

No Attempt 0 ←

→ 1

Fair 2 ←

→ 3

Good 4 ←

→ 5

Complete 6 ←

(b) Suggest **two** improvements to the design of this toy.

6 Marks

1. Make frame from thicker wood. (3)
2. Use wheels with tyres for greater grip. (3)

(c) (i) The toy truck uses potential energy to make it move. Briefly describe how the movement mechanism of the truck operates.

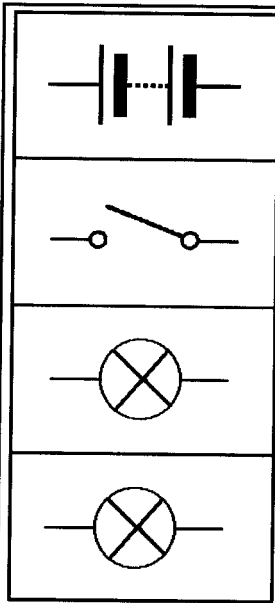
Weight is wound up by reversing truck, potential energy then propels truck forward. (2)

(ii) List **two** other forms of energy conversion and give an example in each case.

1. Chemical to Heat. Example: Fire. (2) (1)

2. Electrical to Sound. Example: Speaker. (2) (1)

(d) You have been asked to include two lights in the front of the toy truck. Using the components shown, draw a circuit diagram that will allow both lights to be switched on together.



Draw the Circuit Diagram here

- Battery** 1
- Switch** 1
- Bulb 1** 1
- Bulb 2** 1
- Bulbs in series** 2
- Circuit complete** 2

(e) Give **two** ways to save energy in our homes.

1. Insulate (2)

2. Turn off lights when not needed. (2)

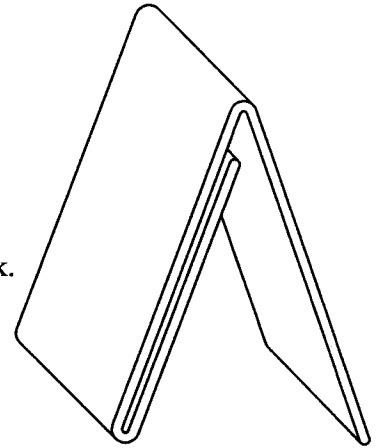
(a) A design of a photograph holder is shown: 10 Marks

(i) What material would you use to make the holder?

Material: Acrylic 3

(ii) If you were asked to design a photograph holder to display a picture of your school's basketball team, state **three** questions you would need to ask.

1. What size is the photograph of the basketball team? 3
2. Will the photograph be mounted on a wall? 2
3. Will I need to allow space for the names of team members? 2



(b) Give **four** different processes used in the manufacture of the photograph holder and name **one** tool or item of equipment used in each process. 10 Marks

Process		Tool or Equipment	
1. <i>Marking out</i>	2	<i>Scriber</i>	2
2. <i>Cutting</i>	1	<i>Saw</i>	1
3. <i>Filing</i>	1	<i>File</i>	1
4. <i>Bending</i>	1	<i>Strip heater</i>	1

(c) Explain the terms: **Transparent** and **Opaque** 6 Marks

Transparent: See through. 3

Opaque: Can't see through. 3

(d) Name **three** different types of plastic and give a different use for each one. 6 Marks

Plastic:	<i>Nylon</i>	1
Use:	<i>Gears</i>	1

Plastic:	<i>PVC</i>	1
Use:	<i>Windows</i>	1

Plastic:	<i>Polystyrene</i>	1
Use:	<i>Packaging</i>	1

(e) Wood is a very important material in Technology. Name **one** use of wood in each of the following categories. 8 Marks

Category	Use	
In the House	<i>Pine Doors, stairs.</i>	2
In the Garden	<i>Garden Fencing, sheds.</i>	2
In the Park	<i>Signposts, benching.</i>	2
Sport	<i>Hurley</i>	2