



Murrayfield Ice Rink
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Educational School Visit

1. Front Foyer

- A. The Classroom will be greeted by the Duty Tour Manager. He will introduce himself to the children and set the rules of the visit.
- B. Why are they here? To learn about ice rinks. So let's have a look at one. Take the class through the Foyer Doors into the Main Arena.

2. Main Arena behind Foyer Doors

Mention what is going on, on the ice, if anything.

- A. MIR is not just an Ice Rink it's a part of Scotland's history...
 - Nearly 80 years old and part of Historic Scotland listed buildings.
 - Historic start with WWII
 - Ice Hockey with the Racers, Royals and now Capitals.
 - Ice Dance and Figure Skating.
 - Curling history led to the opening of Murrayfield Curling
- B. How does an Ice Rink works? Like a fridge freezer.
 - a. What is the difference between natural ice and artificial ice?

Natural Ice is ice that formed itself in the wild without the help of any machinery. We can find it during winter or on the mountains top or at the north/south pole. To have an operational ice rink all year around in Edinburgh we can't rely on natural ice. Artificial Ice is formed using machinery.
 - b. So, how do we make artificial ice?
 1. We need to change water into ice for that we need to create some cold. We explain the layout of the pipework underneath the concrete floor. We introduce the notion of refrigerant gas; we will go more in-depth once we are in the plant room.

2. How much ice do we have? We talk about the size of the pad, the sickness of the ice and the different layers (ice / white paint / ice / hockey markings and logos / ice).

C. What do we need to make an Ice Pad?

- A Plant Room to produce the cold.
- Pipe work to bring the cold under the pad
- Surfacing Machine to maintain the ice in skating condition.
- Dehumidifier to control the level of humidity in the rink.
- We added a Low Emissivity Ceiling to reduce environmental impact. With this ceiling and the new plant we reduced our CO2 emissions by 200 tonnes / year.

D. Let's go see the plant room up close...

3. Plant Room

A. Welcome to the Plant Room, the beating heart of the Ice Rink...

- The Pipe Works are the Blood Vessels: look at the arrows on the pipe they tell you which way the flow is going. It is Brine going through the pipe; this is salt water so it doesn't freeze. Approximately 4'000 gallons of Brine in circulation.
- The Pumps are the Heart's Valves: they force the brine through the 10 miles long pipe works.
- The Chillers are the Sweat Glands: they have for mission to keep the brine at a set temperature. How do they do that? With compression and expansion of a gas, like your deodorant can...
- The Control Panel is the Hypothalamus: Because Ice is a living thing, we need to change the temperature of the brine:
 - i. The weather condition
 - ii. The amount of people on the ice
 - iii. The type of activities: Figure Skaters like their ice soft, the hockey player like it hard and the curler like it extra hard...

We need to anticipate the temperature we'll need in two hours times otherwise it will be too late...

- B. This plant was installed in 2012; from 1986 to 2012 the rink run with a Star plant but the gas R22 used was banned by the EU. And before that it runs on Ammonia compressors which was really dangerous in case of a leak...
- C. An interesting thing to point out to the class is that when we produce artificial cold we also create warm. It is a physic principle. Even so we don't use that warm at MIR, a lot of leisure complex are built with that in mind. The association of an ice rink and a swimming pool is the wider spread example. The rink warms up the pool and the pool cools down the rink...
- D. Now let's follow the Blood Vessels...

4. Header Pipes by First Aid Room

- Show where the header pipe comes from and where it's going.
- Explain the flow and return pipes.

5. Surfacing Machine / Dehumidifier

A. Taking care of the ice

- After having skater on the ice pad we need to resurface it to make it all smooth again.
- Cutting the ice to make it flat again
- Put Water down to always have ice... We use 1'000 litres every time...
- With older children we can talk about where the snow (chip ice) goes...

B. Dehumidifier

We need this piece of equipment to lower the humidity present in the air over the Ice Pad, otherwise due to the difference of temperature between the surface of the ice and the ambient air a mist will create and after that drips of water will form on the ceiling and will damage the ice...

6. Skate-Hire

We took you through the technical side of running an Ice Rink; now let's talk about the human side of it:

- A. To look after the different pieces of machinery we need a team of engineers.

- B. During a public skating session we need Box Office staff, Skate Hire Staff and if it's a busy session we will add Café Staff.
- C. We also have people working on the ice: the Ice Steward, Skating Coaches and Professional Ice Hockey Players.
- D. And finally to make sure everything run smoothly we need a management team.

Open the floor to question about the visit.

7. Front Foyer

After taking the class back to the front foyer the Duty Tour Manager will say goodbye to the classroom and give to every child a fact sheet about the Ice Rink and the Building.

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