| **OrientationCompass with solid fill** | **QR audio** |
| --- | --- |

Through the preceding activities, some questions arose regarding the Alm Dish....

1. Can we recognize the value of the Alm Dish? What was its use? Was it part of a treasure or an everyday object?

2. Can we date it?

3. What are the ingredients of which it is composed? What are their properties?

4. Can we identify maintenance procedures?

*Discuss the above questions in the classroom as a whole*

**How can we answer these questions?**

**Record the results of the discussion**

|  |
| --- |

| *Record the views heard with a short video or audio recording  Name it “1.a Problems and Solutions”* | | *QR audio* |
| --- | --- | --- |
| **Conceptualization Questions outline** | **QR audio** | | |

*Discuss as a whole class.*

**How can we see item details?**

*Note or draw tools we can use   
to see details of an object*

| Instruments / Devices | Select |
| --- | --- |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

|  |
| --- |

*Discuss as a whole class about the instrument that can give us the best results and choose it from the table above.*

| *Record the views heard  with a short video or audio recording.*  *Name it “1.b Conceptualization”* | | *QR audio* |
| --- | --- | --- |
| **Research Research with solid fill** | **QR audio** | |

Use your mobile devices (tablets, mobile phones, etc.) and scan the QR below.

Watch the video and download the results for your chosen device for the Alm Dish by clicking on the **"Results"** button.

****

***Discuss with the whole class the results of this particular device***

* In the first point of interest, we observe the disc at its edge. Can you describe how does the sample taken from the disk appears in the optical microscope?
* In the second point of interest, we observe gold traces in the relief part of the disc. Can you describe how they look under the optical microscope?

| *Discuss and record what the device does with a short video or audio recording.*  *Why do we use it and what results does it give us?  Name it “1.c Research”* | *QR audio* |
| --- | --- |

| **Conclusion Thought outline** | **QR audio** |
| --- | --- |

* **Why do we see three different images for the same point of interest? Can you sort them from lowest to highest magnification?**
* **Do you observe anything different in the images of the different areas of the object we focused on?**

*Write down your observations or draw the pictures below with arrows for the points of special interest.*

|  |
| --- |

| *Record your answers  in two different short videos or audio recordings.*  *Name them "1.d Conclusion A", "1.d Conclusion B"* | | *QR audio* |
| --- | --- | --- |
| **Conceptualization Questions outline** | **QR audio** | | |

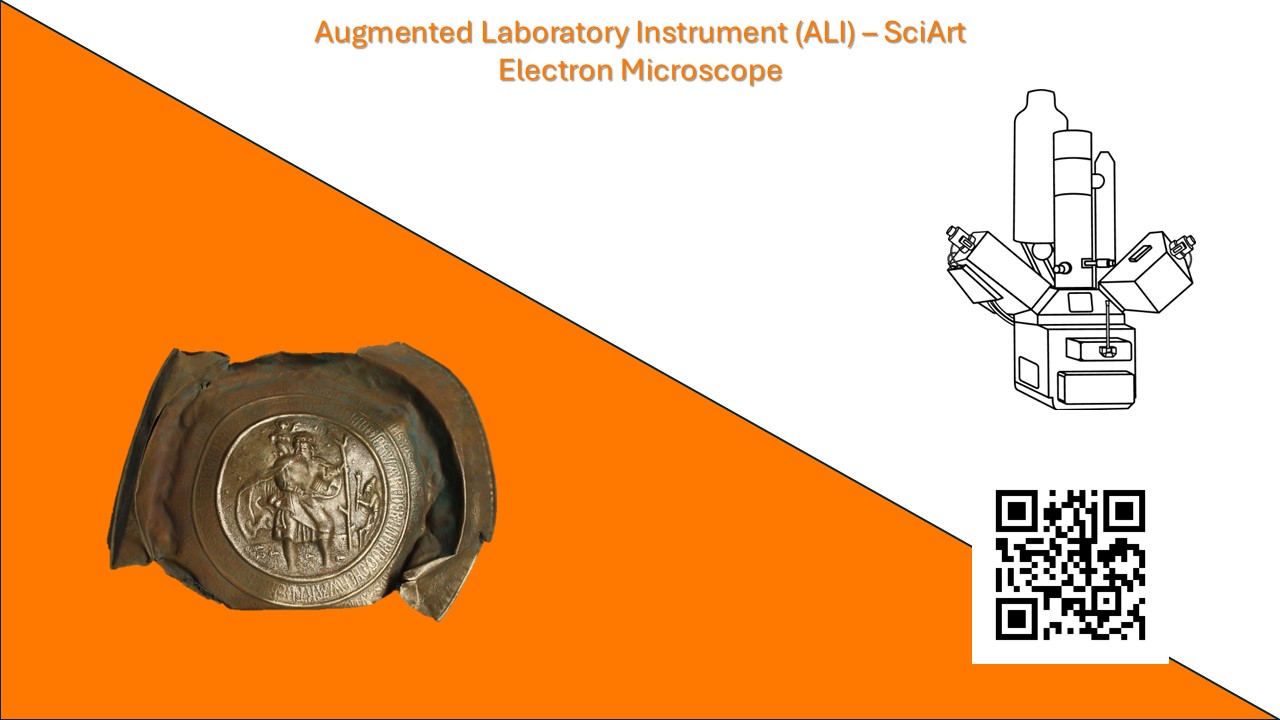
*Discuss as a whole class.*

**What do we need to do to get more information   
about the points of interest?**

| *Record the views heard  with a short video or audio recording.*  *Name it “2.b Conceptualization”* | | *QR audio* |
| --- | --- | --- |
| **Research Research with solid fill** | **QR audio** | | |

Use your mobile devices (tablets, mobile phones, etc.) and scan the QR below.

Watch the video and download the results the device gives for the Alm Dish by clicking the **"Results"** button.

****

***Discuss the results of this device in the classroom***

* In the first point of interest, from the sample taken from the right edge of the disc, what do you observe in the SEM image? Can you describe its morphology?
* In the second point of interest, from the sample taken from the gold traces in the embossed part of the disc, what do you observe in the SEM image? Can you describe its morphology?

| *Describe how the device works and what we use it for*  *with a short video or audio recording.*  *Name it “1.c Research”* | | *QR audio* |
| --- | --- | --- |
| **Conclusion Thought outline** | **QR audio** | | |

* **Which one of the two different points of interest, scanned with the SEM method, has the highest magnification? How can we find it?**
* **Why do we get black and white images?**

* **What do we observe in the images? What might they mean for our subject? Can we conclude the components in the points of interest (material on the edge of the disc and gold traces in the relief part of the disc)?**

| *Record your answers  in three different short videos or recordings.*  *Name them "2.d Conclusion A", "2.d Conclusion B",  "2.d Conclusion C"* | | *QR audio* |
| --- | --- | --- |
| **Conceptualization Questions outline** | **QR audio** | |

*Discuss as a whole class.*

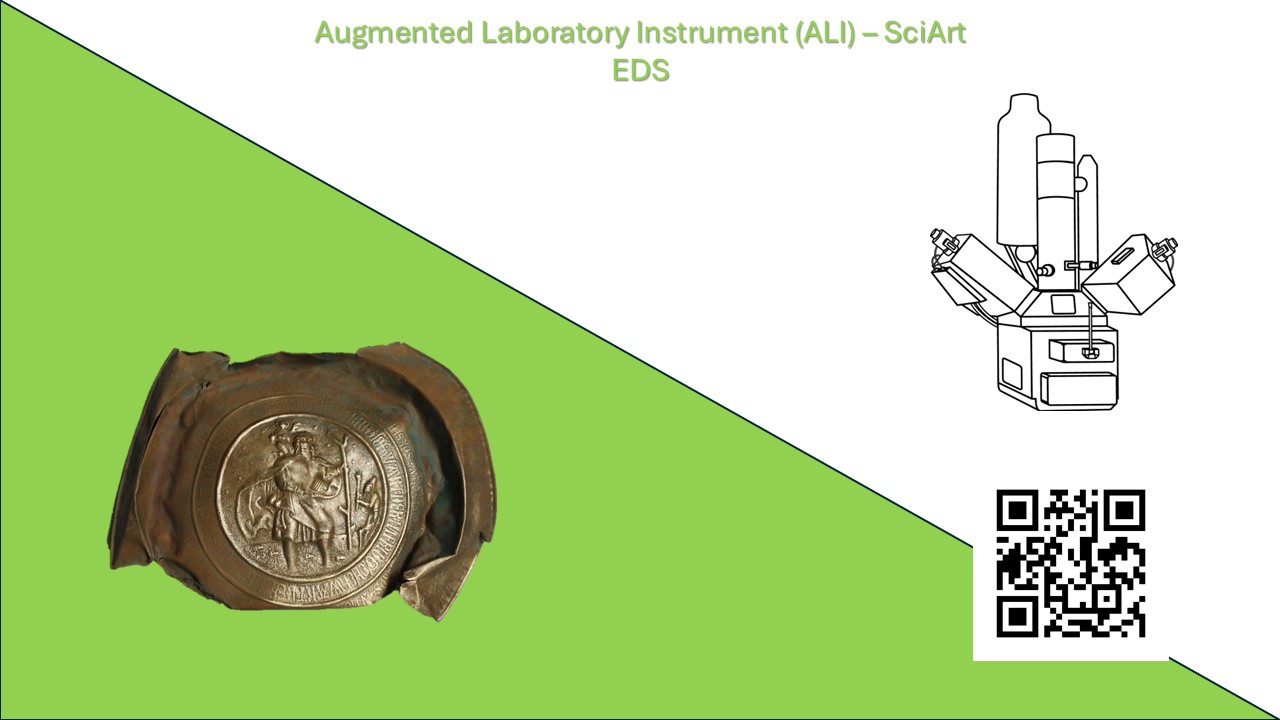
**What do we need to do to find the components   
of the points of interest of the artifact we are studying?**

**What should we recognize?**

| *Record the views heard  with a short video or audio recording.*  *Name it “1.b Conceptualization”* | | *QR audio* |
| --- | --- | --- |
| **Research Research with solid fill** | **QR audio** | | |

Use your mobile devices (tablets, mobile phones, etc.) and scan the QR below.

Watch the video and download the results of the Alm Dish method by clicking on the **"Results"** button.

****

***Study in your group and then discuss with the whole class   
the results of this particular method***

* In the first point of interest, from the sample taken from the edge of the disk, what do you observe in the EDS spectrum? What elements does it consist of?
* In the second point of interest, from the sample we took from the gold layer, what do you observe in the EDS spectrum? What elements does it consist of?



| *Discuss and record how the method works*  *with a short video or audio recording.*  *What results did it give us? What else did we have to do?*  *Name it “3.c Research”* | | *QR audio* |
| --- | --- | --- |
| **Conclusion Thought outline** | **QR audio** | | |

List the materials in which the elements found in our sample are found in the table below.

| **Points of interest** | **Chemical Compounds** |
| --- | --- |
| Material of the right edge of the disc |  |
| Gold traces in the relief of the disc |  |

| *Record your answers  in a short video or audio recording.*  *Explain how you got there.*  *Name them "3.d Conclusion"* | | *QR audio* |
| --- | --- | --- |
| **Conceptualization Questions outline** | **QR audio** | | |

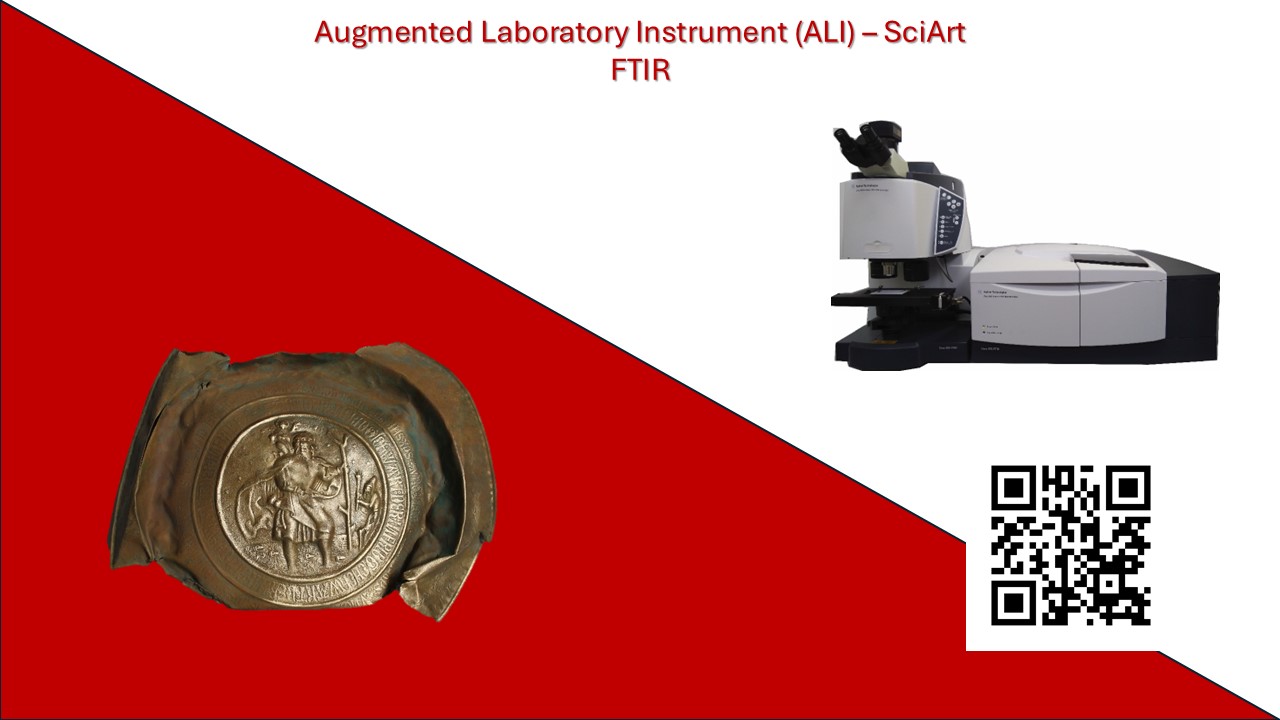
*Discuss as a whole class.*

**What information will we get if we use the FTIR method to the two points of interest?**

| *Record the views heard  with a short video or audio recording.*  *Name it “4.b Conceptualization”* | | *QR audio* |
| --- | --- | --- |
| **Research Research with solid fill** | **QR audio** | | |

Use your mobile devices (tablets, mobile phones, etc.) and scan the QR below.

Watch the video and download the results of the Alm Dish method by clicking on the **"Results"** button.

****

***Discuss the results of this method with the whole class***

* In the first point of interest, the sample taken from the disk edge, what do you observe in the FTIR spectrum? Does it give results?
* In the second point of interest, the sample taken from the gold traces, what do you observe in the FTIR spectrum? Does it give results?

| *Discuss and record how the method works  with a short video or audio recording. What results did it give us?*  *Name it “4.c Research”* | | *QR audio* |
| --- | --- | --- |
| **Conclusion Thought outline** | **QR audio** | | |

* **Does the FTIR method give results for all materials? If not, list in the table below the materials that did not give results.**

|  |
| --- |
|  |

| *Record your answers  in a short video or audio recording.*  *Explain how you got there.*  *Name them "4.d Conclusion"* | | *QR audio* |
| --- | --- | --- |
| **Conceptualization Questions outline** | **QR audio** | | |

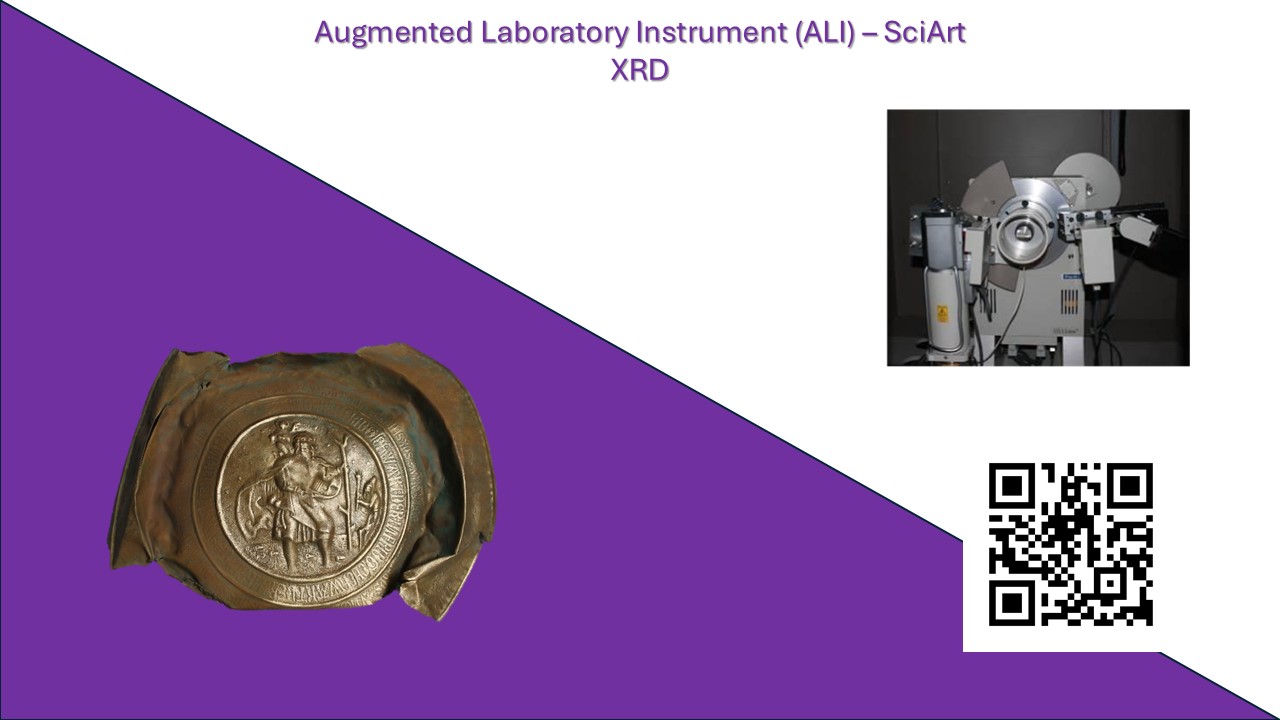
*Discuss as a whole class.*

**What might the inability to identify a chemical compound by FTIR method mean for some materials?**

| *Record the views heard  with a short video or audio recording.*  *Name it “5.b Conceptualization”* | | *QR audio* |
| --- | --- | --- |
| **Research Research with solid fill** | **QR audio** | | |

Use your mobile devices (tablets, mobile phones, etc.) and scan the QR below.

Watch the video and download the results of the Alm Dish method by clicking on the **"Results"** button.

****

***Discuss in the whole class the results of this particular method***

| *Discuss and record how the method works  with a short video or audio recording.*  *What results did it give us?*  *Name it “4.c Research”* | | *QR audio* |
| --- | --- | --- |
| **Conclusion Thought outline** | **QR audio** | | |

* **Write down the material/chemical compound you have identified by using the XRD method.**

| **Points of interest** | **Chemical Compounds** |
| --- | --- |
| Material of the tray |  |
| Gold traces on the disc |  |

| *Record your answers  in a short video or audio recording.*  *Explain how you got there.*  *Name them "4.d Conclusion"* | *QR audio* |
| --- | --- |

**Back to the initial questions...**

1. Can we recognize the value of the Alm Dish? Was it part of a treasure or an everyday object?

2. Can we date it?

3. What are the ingredients of which it is composed? What are their properties?

4. Can we identify maintenance procedures?

| **Conceptualization Questions outline** | **QR audio** |
| --- | --- |

*Discuss as a whole class.*

**How can we use the conclusions drawn from archaeometric methods to answer the initial questions?**

*Please provide questions that you can ask an AI machine. The answers it gives you, combined with the results you already have, will help address the initial questions*

|  |
| --- |

| *Record the questions you will ask on ChatGPT with a short video or audio recording.*  *Name it “6.b Conceptualization”* | *QR audio* |
| --- | --- |
| **Research Research with solid fill** | **QR audio** |

Use ChatGPT to get information on the above questions. Write down the information you need to answer the questions.

| **Question** | **ChatGPT answer key points** |
| --- | --- |
| What is brass? |  |
| What are the properties of brass? Where is brass used today? |  |

*Discuss in class the answers  
to the specific questions you posed on ChatGPT*

| *Note the main points of the answers for each question.  Did it help you find the answer?  How?*  *Name it “4.c Research”* | | *QR audio* |
| --- | --- | --- |
| **Conclusion Thought outline** | **QR audio** | | |

*Record the answers to the initial questions of the investigation.*

| 1. **Can we recognize the value of the Alm Dish (charity tray?)**   **What was its use? Was it part of a treasure or an everyday object?** |
| --- |
|  |
| **2. Can we date it?** |
|  |
| **3. What are the ingredients of which it is composed? What do we know about them?** |
|  |
| **4. Can we identify maintenance procedures?** |
|  |

|  | *QR audio* |
| --- | --- |

**Create a video of your answer to each   
interview question.**

**One of you will ask the question**

**and the other person will answer!!!!**

*Name the videos "Final Answer 1", "Final Answer 2", etc.*