

# CIDOC CRM as a Language for Cultural Heritage Level A1

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What is ontology?

# Formal Ontology: Definitions

“A body of formally represented knowledge is based on a *conceptualization*: the objects, concepts, and other entities that are assumed to exist in some area of interest and the relationships that hold among them...”

A conceptualization is an abstract, simplified view of the world that we wish to represent for some purpose...

An ontology is an explicit specification of a conceptualization.”

**Gruber, 1995**

“An ontology is an explicit, partial account of a conceptualization.”

**Guarino and Giaretta, 1995**

1. KR is a Surrogate
2. KR is a set of Ontological Commitments
3. KR is a Fragmentary Theory of Intelligent Reasoning
4. KR is a medium for Efficient Computation
5. KR is a medium for Human Expression”

Davis et. al, 1993

“An ontology is an explicit, partial specification of a conceptualization that is expressible as a meta-level viewpoint on a set of possible domain theories for the purpose of modular design, redesign and reuse of knowledge-intensive system components.”

**Schreiber, 1995**

# What is an ontology? (What is it not?)

- Mix of computer science and philosophy
- Bridge between computer science world and data producers/researchers
- Formalization of knowledge domain
- Bound to a reality
- Creates a *lingua franca*
- Machine Processable, Human Readable



"A Universal Symbolism, very popular, very agreeable to the people...might be introduced if small figures were employed in the place of words, which would represent visible things by their lines, and the invisible, by the visible, which accompany them."

— Leibniz, 1679

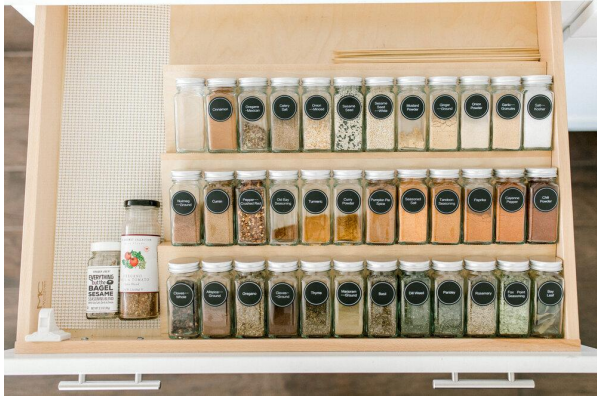


# CIDOC CRM: Qu'est ce que c'est? More simply

Before



After



1. way of organizing your data to be compatible with others
2. way of making your data more interesting to search
3. way of making your data more sustainable and reusable

# Ontology as Language

A way to gain control over our data

A way to make sure our data says what we mean

A way of expressing information accurately

A way to communicate with colleagues across time and space

A long term way of representing and storing our knowledge

A language which must be learnt to be used, like any language



Source: George × Dall-E  
'Paint the tower of babel in the style of Frida Kahlo'

# Ontology Basics

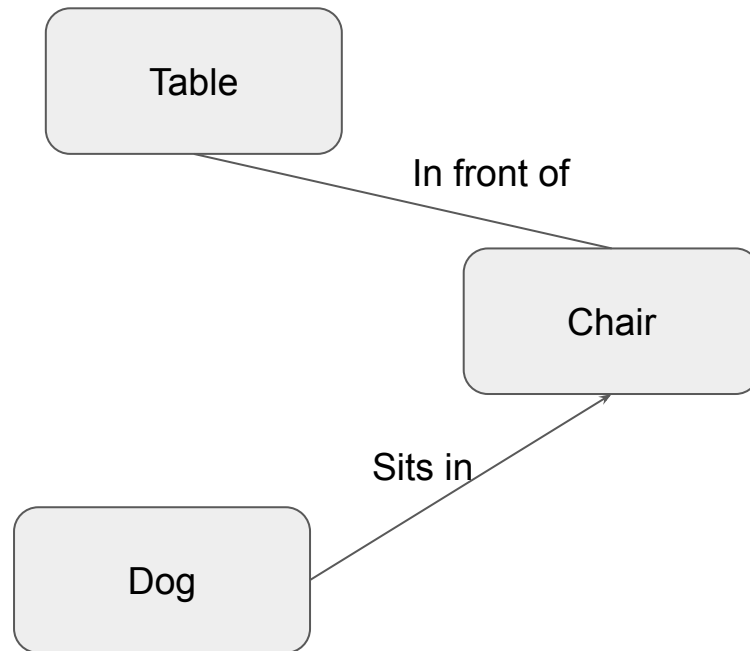
# Basics Recap: Computer Science Ontology



World



A proposition is a picture (model) of reality.  
[A proposition shows its sense (i.e., how things stand if it is true), and says that things do so stand.]



Ontology



# Basic Recap: A Simple Language: Resource Description Framework (RDF)

**Classes:** like generic nouns, pointing out categories of things

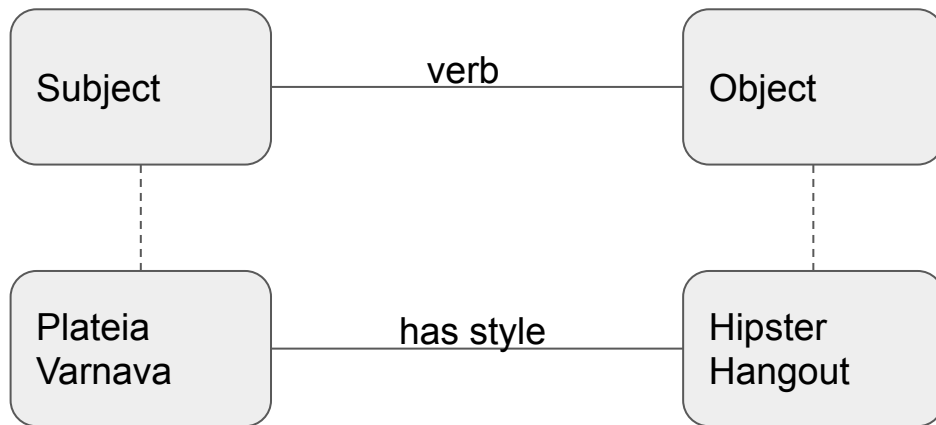
**Properties:** like generic verbs, pointing out how things related

Start with simple sentences,

S-V-O

Make more complex

S-V-O-V-S etc.



# Ontology Lesson 1: Classes and Inheritance

# Classes

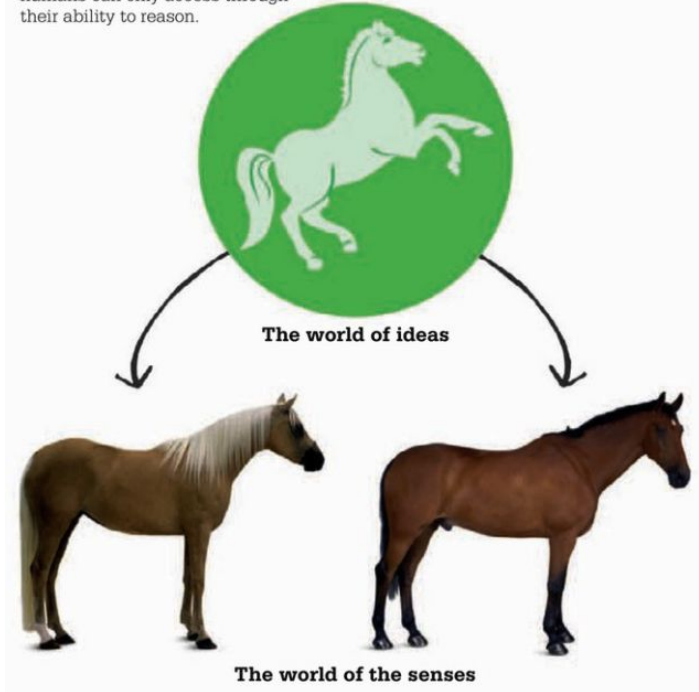
A class in a formal ontology is a formal idea that provides a definition for a set of things in the world that all share some basic set of shared properties - according to the definition.

A class allows us to identify real world things that match its definition as belonging in common to the same kind or set of things.

Identifying an individual object as belonging to a class gives us a starting point for knowing and making claims about that thing.

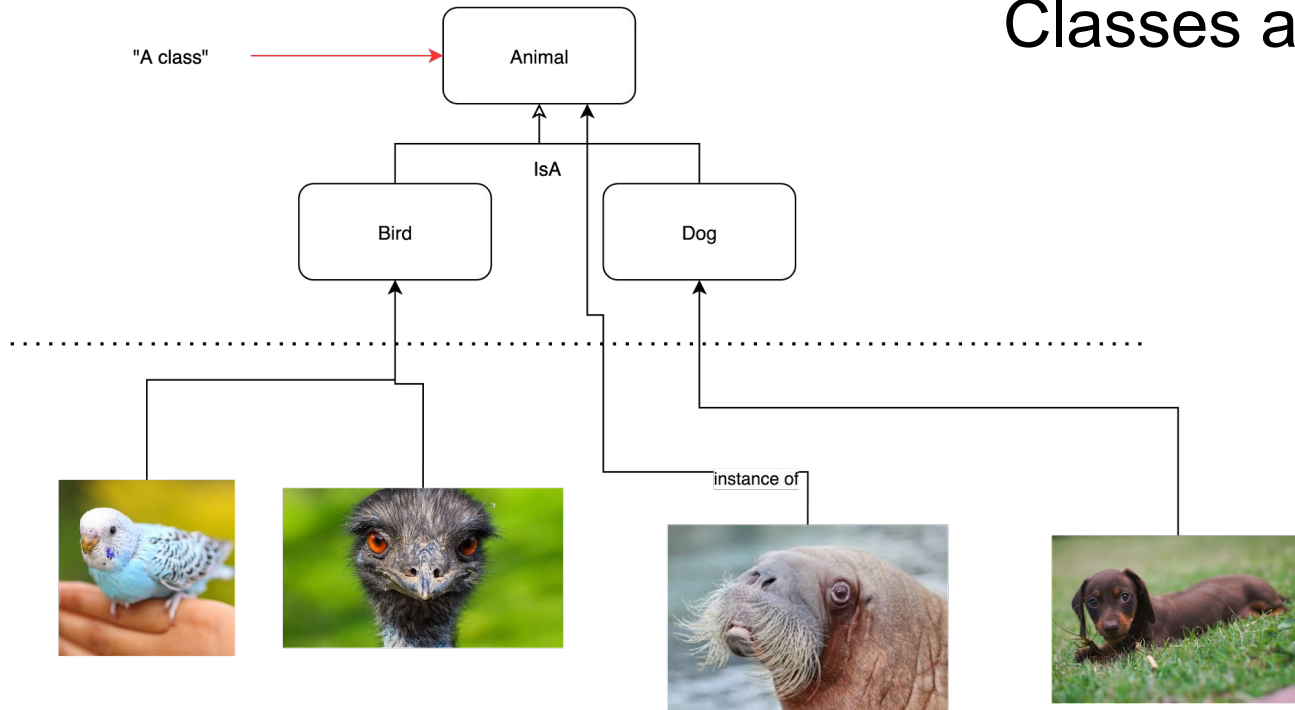
In RDF language a Class is a tool by which one can classify objects as belonging to a type and is able to make queries about things of some type.

**According to Plato's theory of Forms**, every horse that we encounter in the world around us is a lesser version of an "ideal", or perfect, horse that exists in a world of Forms or Ideas—a realm that humans can only access through their ability to reason.



Platonic Realm of Forms:  
the 'Ontology'

# Classes and Inheritance



The World: tables, chairs, cats  
and dogs

The Mind: epistemology,  
questions, curiosities

"How many animals are there"

"Show me puppies!"

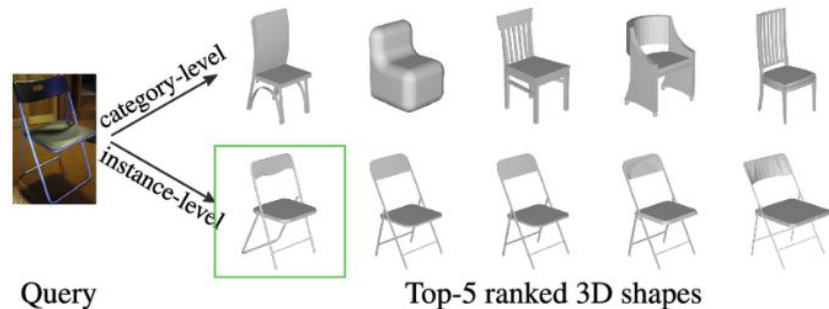
"What birds are there?"

# Exercise 1

In the provided spreadsheet

- In the **Lesson 1a tab** identify which examples are classes and which are instances
- In the **Lesson 1b tab**, try to create a one level hierarchy between the classes.

An example has been filled out to follow in both cases.



Source:

[https://www.researchgate.net/figure/Comparison-of-category-level-and-instance-level-single-image-based-3D-shape-retrieval-As\\_fig1\\_343351996](https://www.researchgate.net/figure/Comparison-of-category-level-and-instance-level-single-image-based-3D-shape-retrieval-As_fig1_343351996)

## Exercise Spreadsheet

[https://drive.google.com/drive/folders/1-rt99TCG9JhOlue0loKfUflif\\_a-Dhdk?usp=drive\\_link](https://drive.google.com/drive/folders/1-rt99TCG9JhOlue0loKfUflif_a-Dhdk?usp=drive_link)

# Ontology Lesson 2: Properties

# Properties

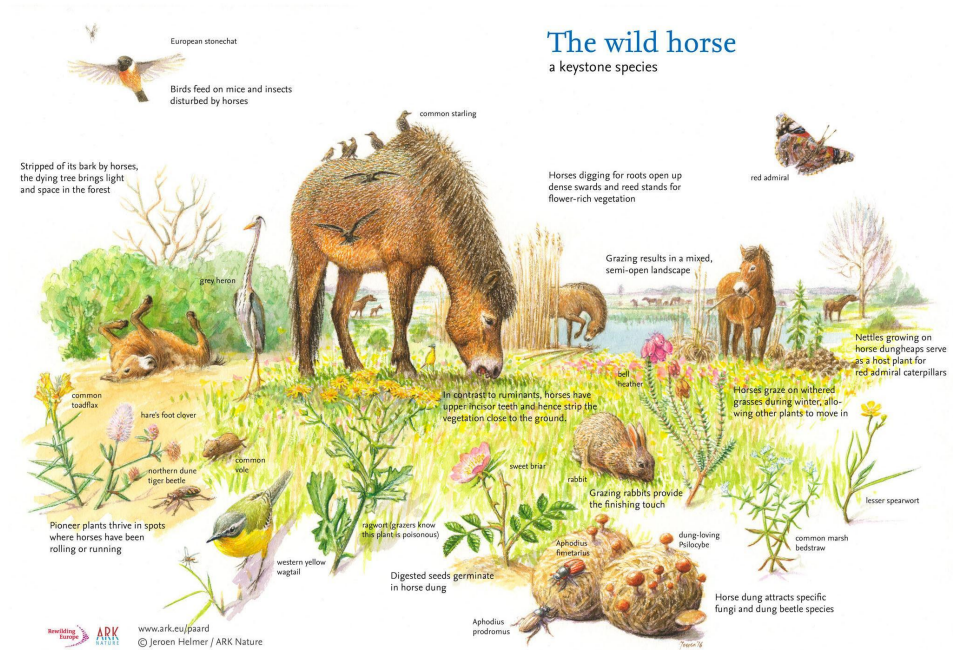
A property in a formal ontology is a formal idea that provides a definition for a kind of fact that can exist in the world between two things or between a thing and itself.

A property allows us to express characteristic kinds of facts that hold between actual real world things.

Properties are defined as potentially holding between two classes (two kinds of things) which means that not all properties can be used for talking about all things. In theory we can only make sensible sentences.

Properties allow us to express salient facts that hold between one or more (usually more) real world things.

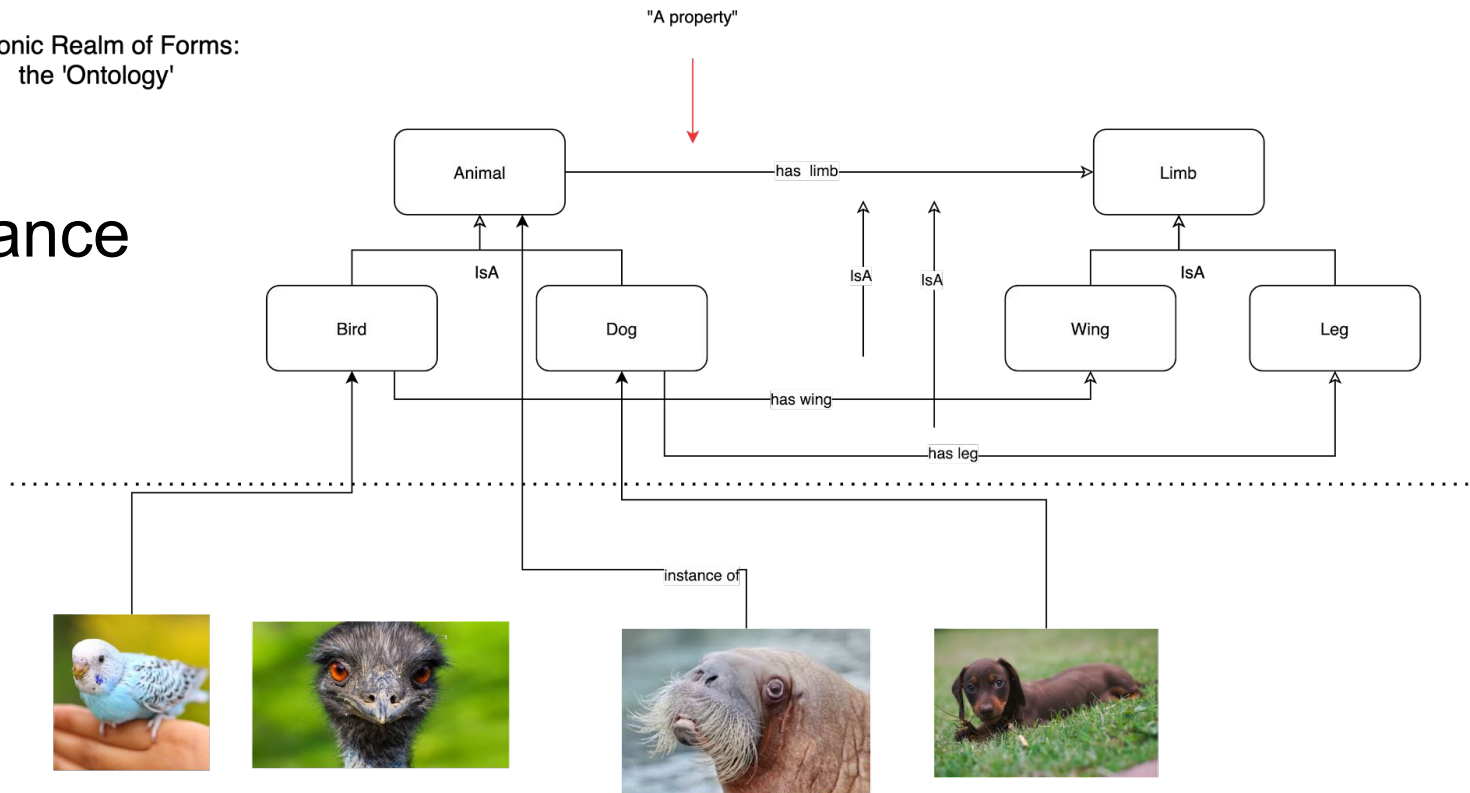
In RDF language a Property is a tool by which we can classify relationships between things in the world that we talk about.



Source: Rewilding Europe

Platonic Realm of Forms:  
the 'Ontology'

# Properties and Inheritance



The World: tables, chairs, cats  
and dogs

The Mind: epistemology,  
questions, curiosities

"How many animals with limbs"

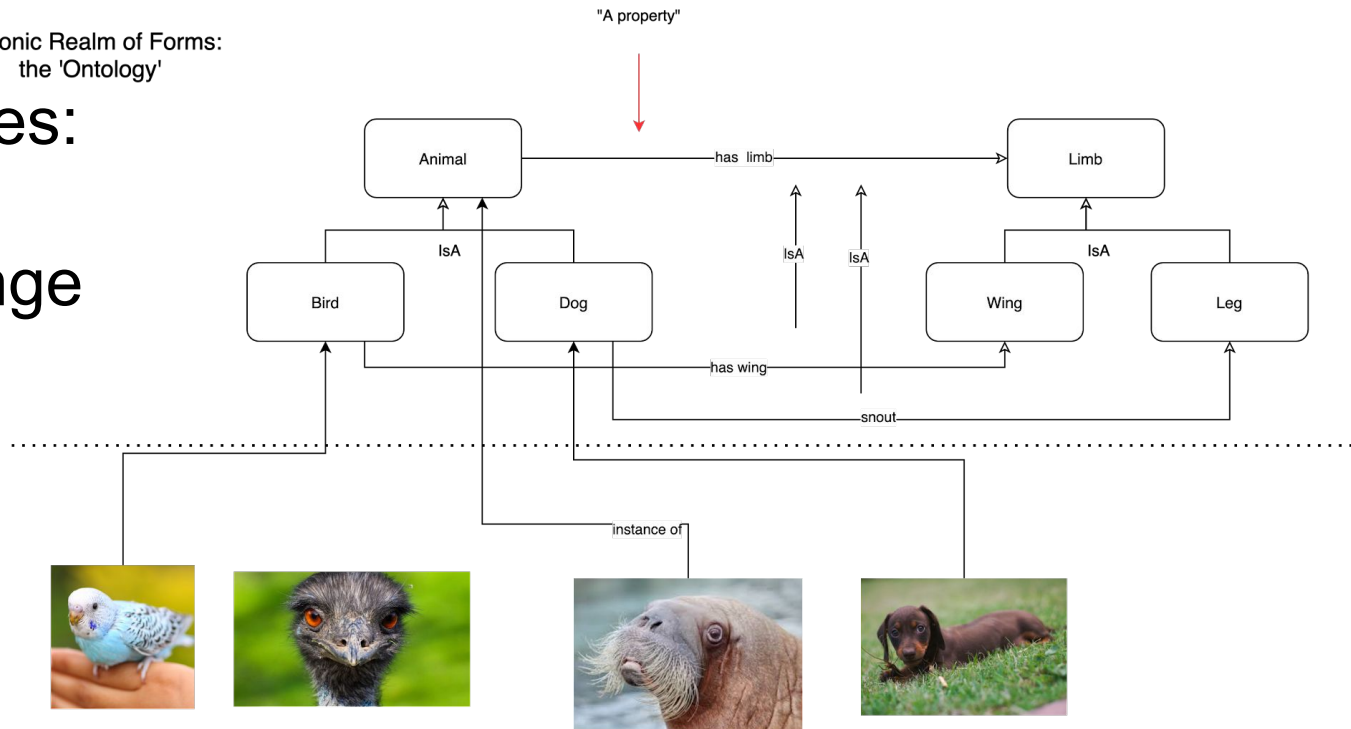
"How many animals with legs?"

"Which animals have wings?"



Platonic Realm of Forms:  
the 'Ontology'

# Properties: Domain and Range



The World: tables, chairs, cats  
and dogs

The Mind: epistemology,  
questions, curiosities

"The dog has this wing" X

"The budgee has This limb"

"The budgee has this wing"

"The Emu has that wing"

# Exercise 2

In the provided spreadsheet

- In the **Lesson 2a tab** identify which examples are properties, which classes and which are instances
- In the **Lesson 2b tab**, try to indicate sensible / appropriate domain and range classes for the properties listed

An example has been filled out to follow in both cases.



Source: <https://gearjunkie.com/outdoor/hunt-fish/backyard-archery-targets>

## Exercise Spreadsheet

[https://drive.google.com/drive/folders/1-rt99TCG9JhOlue0loKfUflif\\_a-Dhdk?usp=drive\\_link](https://drive.google.com/drive/folders/1-rt99TCG9JhOlue0loKfUflif_a-Dhdk?usp=drive_link)

# Ontology Lesson 3: Instances!

# Instances

Instances for a formal ontology are tokens that represent real world things that can be declared as belonging to a class and, thereafter, about which we can make statements using properties.



Source: George × Dall-E

# Exercise 3

In the provided spreadsheet

- In the **Lesson 3 tab** identify which classes the instances belong to

An example has been filled out to follow in both cases.



Source: George x Dall-E

"paint a picture in the style of frida kahlo of three buckets labelled fish, cats, knives. The fish bucket overflows with fish. The cat bucket overflows with cats. The knives bucket overflows with knives."

## Exercise Spreadsheet

[https://drive.google.com/drive/folders/1-rt99TCG9JhOlue0loKfUflif\\_a-Dhdk?usp=drive\\_link](https://drive.google.com/drive/folders/1-rt99TCG9JhOlue0loKfUflif_a-Dhdk?usp=drive_link)

# CIDOC CRM Overview

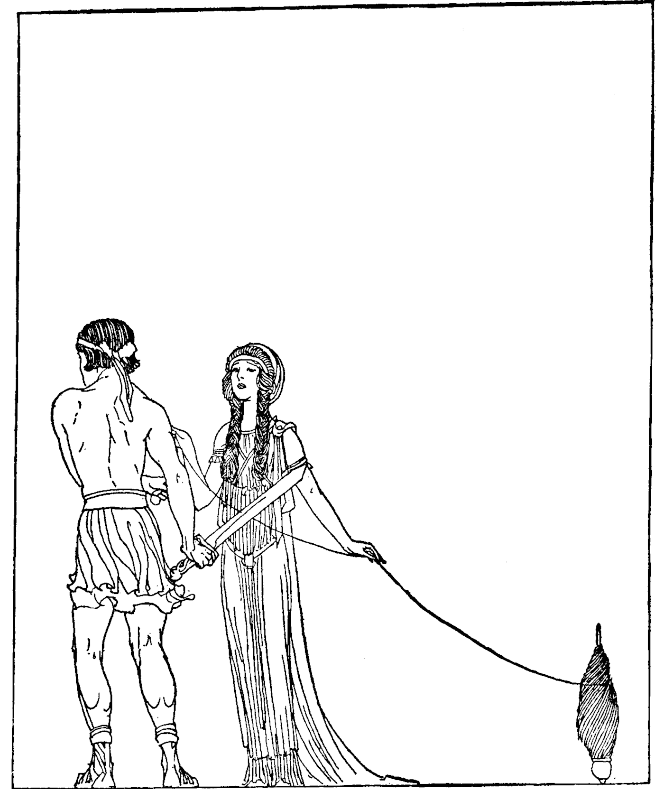
# CIDOC CRM Ontology and Modelling, Where to Begin?

Language of

90+- Classes / Nouns &  
160 +- Properties / Verbs

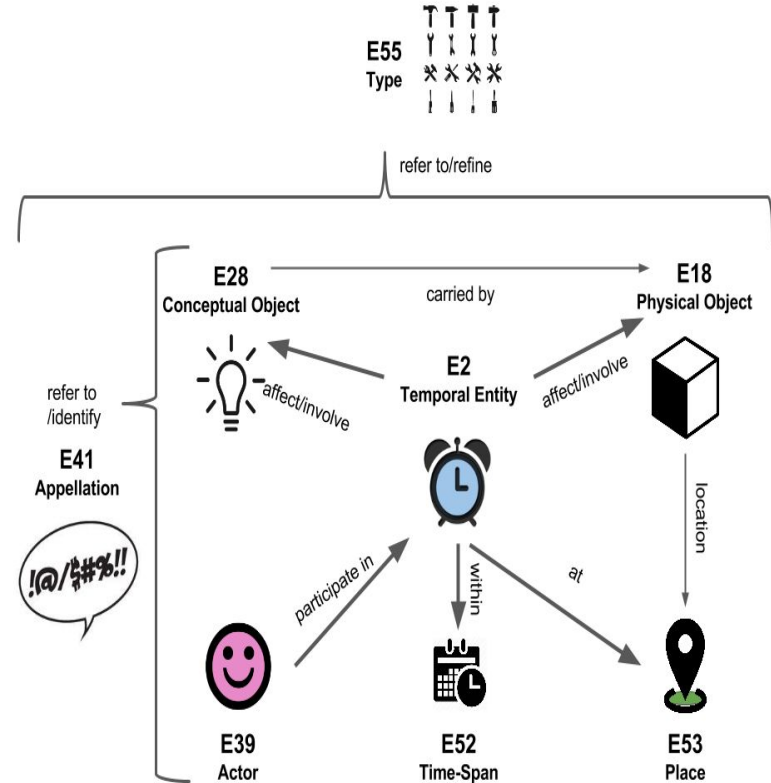
The Standard: [Link](#)

Friendly Representation: [Link](#)



# What is CIDOC CRM?

- “The overall scope of the CIDOC CRM can be summarised in simple terms as the curated knowledge of museums...”
- A lingua franca for cultural heritage specialists to express and exchange knowledge in a machine readable format
- A collaborative effort to support:
  - a generic model of recording of “what has happened” in human scale
  - generate huge, meaningful networks of knowledge by a simple abstraction: history as meetings of people, things and information





# CIDOC CRM as a Language Level A1

# Learn it like a Language

Lesson 1: **This is a ....**

Lesson 2: **What's there to talk about?**

Lesson 3: **What's it called?**

Lesson 4: **What kind of thing is that?**

Lesson 5: **What happened?**

Lesson 6: **Telling Time**

Lesson 7: **Describing the Physical**

Lesson 8: **Describing the Conceptual**

Lesson 9: **Talking about Endings and Beginnings**

Lesson 10: **Where is / was it?**

CIDOC CRM Lesson 1: This is a ...

# Lesson 1: This is a ...

*The most basic thing that we can and must assert in our formal language to begin communicating about any object is what something is.*

Natural language sentences of this type are of the form:

**X is a Y.**

X is the thing we are talking about.

Y is the kind of thing we say it is.

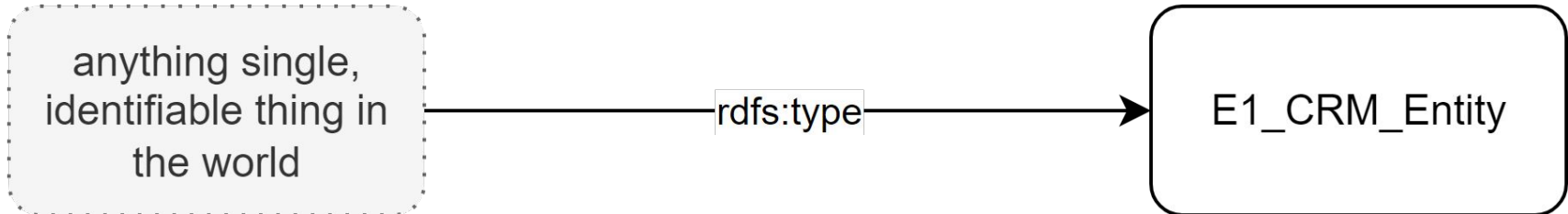
Rdfs:type is the verb that lets us say **X is a Y**.



Title: The Anatomy Lesson of Dr Nicolaes Tulp

Creator: Rembrandt

Source: <https://bit.ly/3qPYWFI>



# Lesson 1: Examples

## Natural Language

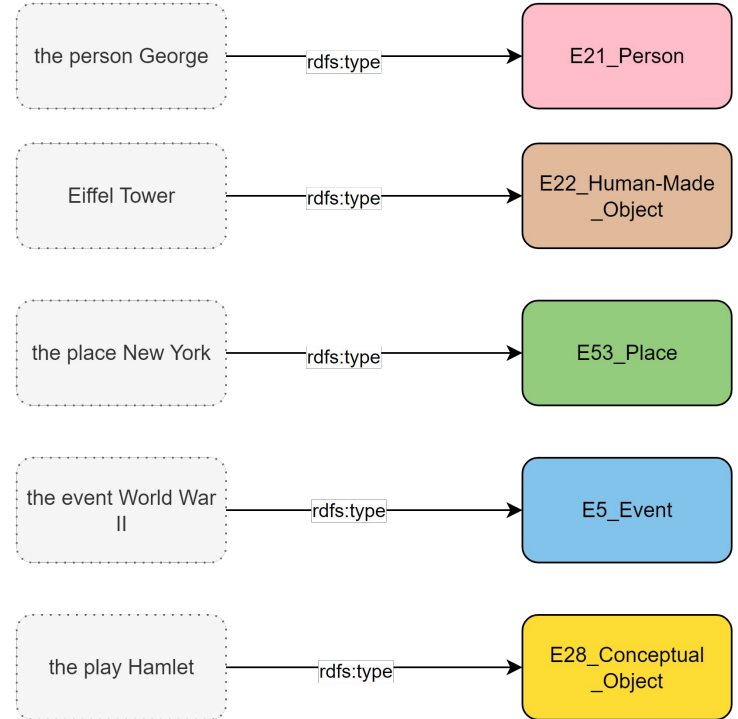
The person George **is a** E21 Person

Eiffel Tower **is a** E22 Human Made Object

The place New York **is a** E53 Place

The event World War II **is a** E5 Event

The play Hamlet **is a** E28 Conceptual Object



# Exercise 1

In the provided spreadsheet

- In the **Lesson 1 tab** identify which classes the instances belong to

Use your intuition when looking at the CIDOC CRM classes. What does the class sound like to you. This is not always a good idea, but it's a place to start...

An example has been filled out to follow in both cases.



Source: <https://classmonitor.com/learn/activity/17d4535de7>

## Exercise Spreadsheet

[https://drive.google.com/drive/folders/1ukt\\_eLkC\\_HTJRIEWLwEvl\\_a3nMcOjG16?usp=drive\\_link](https://drive.google.com/drive/folders/1ukt_eLkC_HTJRIEWLwEvl_a3nMcOjG16?usp=drive_link)

# Lesson 1: Learning Outcomes / Review

Natural Language Sentence Types
This is a ...

Class	Subclass of
E1 CRM Entity	rdfs:Class

Basic Formal Language Skill
Indicate an instance of a class

Property	Domain	Range
rdfs:type	rdfs:Resource	rdfs:Class

Interlude: Frida Kahlo!



# Semantics works best with examples



Title: The Two Fridas

Creator: Frida Kahlo

Source: <https://www.fridakahlo.org/the-two-fridas.jsp>

Ontology and semantics allow us to create fact based networks of knowledge about real world things. “Stories”, but non-fictional ones.

Here is a textual version of Frida Kahlo’s story:

[https://en.wikipedia.org/wiki/Frida\\_Kahlo](https://en.wikipedia.org/wiki/Frida_Kahlo)

Here is a spreadsheet from which we will begin to learn how to tell the story of Frida using CIDOC CRM:

[https://drive.google.com/drive/folders/1ukt\\_eLkC\\_HTJRI\\_EWLwEvl\\_a3nMcOjG16?usp=drive\\_link](https://drive.google.com/drive/folders/1ukt_eLkC_HTJRI_EWLwEvl_a3nMcOjG16?usp=drive_link)

For the rest of this course we will be using the example of the life and work of Frida Kahlo to provide a frame for exploring how to ‘speak’ with CIDOC CRM.

# Lesson 2: What's there to talk about?

## Lesson 2: What's there to talk about?

As large and confusing as our world is, the kinds of things that we talk about break down into a very small set of kinds of things. CIDOC CRM allows for describing five basic kinds of things. Learn these and you have the foundation of thinking in this language.



Title: Argument of the Scholars

Creator: Maurycy Trębacz

Source: <https://bit.ly/3Pi7BKK>

E2\_Temporal\_Entity

E53\_Place

E18\_Physical\_Thing

E28\_Conceptual  
\_Object

E39\_Actor

# Lesson 2: Definitions

E2_Temporal_Entity	Objects which are temporal in nature, something that takes place over time, and about which you want to make assertions regarding their duration, location, involved entities etc.	World War II The Wedding of Charles and Camilla The cleaning of the Parthenon Marbles The Delivery of the News of the Victory at Marathon
E53_Place	Objects which are geometric in nature about which one wants to assert spatial properties like absolute and relative location	Mexico City Mexico North America the floorspace of the classroom the total surface of the painting
E18_Physical_Thing	Objects which are material and substantial in nature and exist as unique singular individuals in the world. About these objects one may make direction assertions of dimension, composition, part whole relations, its function as bearer or holder of information.	Teatihuacan Site The temple of Athina The Nightwatch by Rembrandt
E28_Conceptual_Object	Objects which are ideas and exist in the form of coherent, identifiable concepts that can be identified through time. About these objects one may make direct assertions of composition, part whole relations, their content representational functions.	The play Hamlet The visual contents of the Nightwatch by Rembrandt The Theory of Relativity
E39_Actor	Objects which are agents in nature, having the capability to act as causes in events. Of which one wishes to make assertions of agency and membership.	Picasso Rembrandt Charles Dickens Coca Cola the Getty Museum

# Exercise 2

In the provided spreadsheet

- In the **Lesson 2 tab** identify which classes the instances belong to

Use your understanding of the CIDOC CRM classes as it was taught in this lesson. Now you don't have to work from intuition, you can work from knowledge.

There are many examples, do as many matches as you can. Try to get at least five of each.

An example has been filled out to follow in both cases.



Source: <https://classmonitor.com/learn/activity/17d4535de7>

## Exercise Spreadsheet

[https://drive.google.com/drive/folders/1ukt\\_eLkC\\_HTJRIEWLwEvl\\_a3nMcOjG16?usp=drive\\_link](https://drive.google.com/drive/folders/1ukt_eLkC_HTJRIEWLwEvl_a3nMcOjG16?usp=drive_link)

# Lesson 2: Learning Outcomes / Review

## Natural Language Sentence Types

X is a temporal happening  
X is a geographic place  
X is a physical object  
X is an idea  
X is an agent

## Basic Formal Language Skill

Distinguish between the main kinds of entities that you can talk about in CIDOC CRM

Class	Subclass of
E2 Temporal Entity	E1 CRM Entity
E53 Place	E1 CRM Entity
E18 Physical Thing	E70 Thing
E28 Conceptual Object	E71 Human-Made Thing
E39 Actor	E77 Persistent Item

# Lesson 3: What's it called?

# Lesson 3: What's it called?

*A basic task in any language is to talk about the names that things have. This is also a basic feature of CIDOC CRM.*

Natural language sentences of this type are of the form

**X is called Y.**

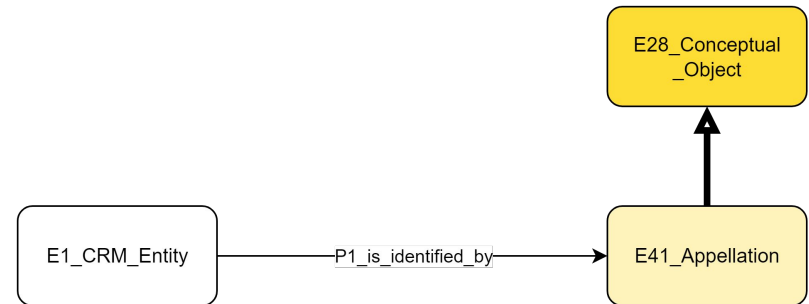
X is the thing we want to give the name of.

Y is the name we want to relate to it.

crm:P1\_is\_identified\_by allows us to make this statement.

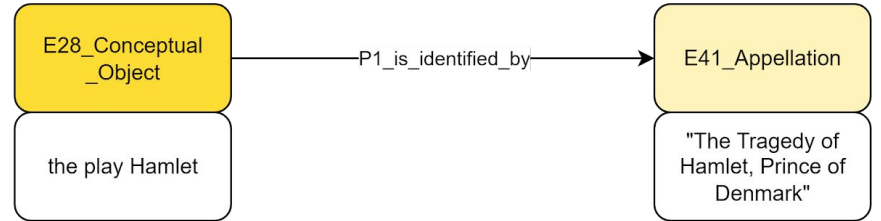
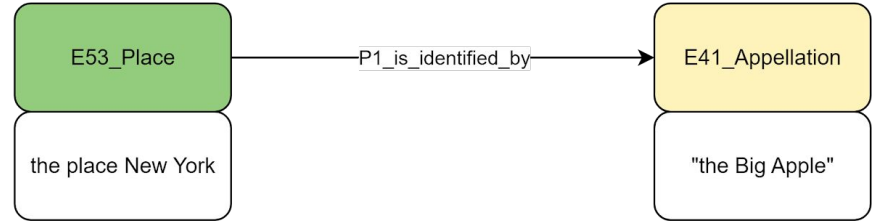
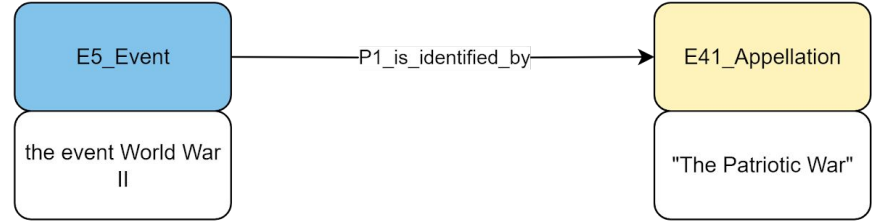
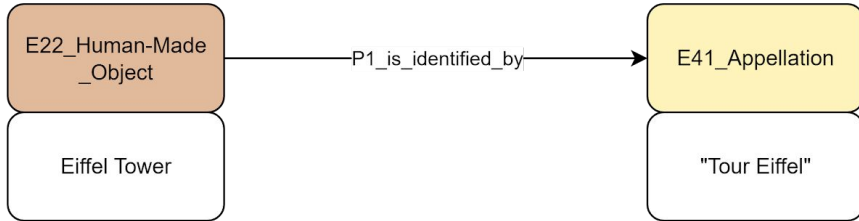
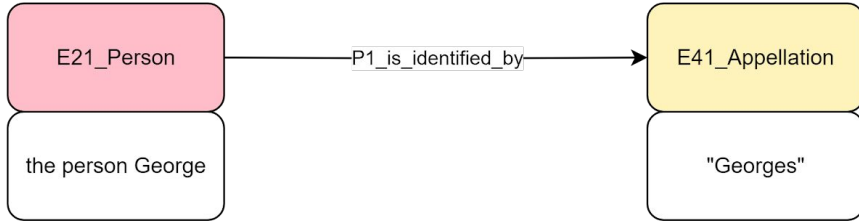
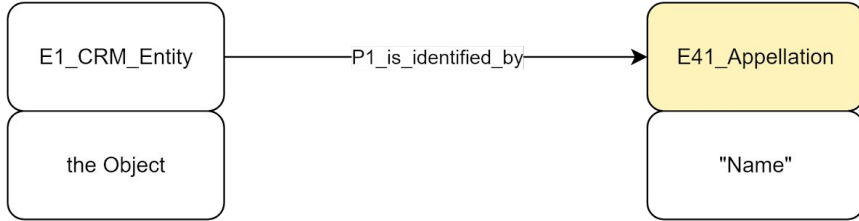


Title: Adam naming the Animals  
Creator: G. Scotin and J. Cole after H. Gravelot and J.B. Chateelain  
Source: <https://bit.ly/3OPYK0S>





# Lesson 3: Examples



# Exercise 3

In the provided spreadsheet

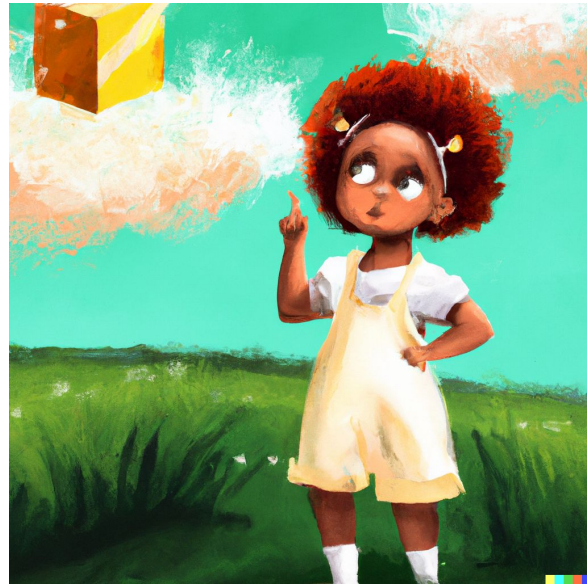
In the Lesson 3 tab you will see a list of the E28 Conceptual Objects from the total list of Frida Kahlo entities. identify which of these are also E41 Appellation. Identify as many as you can.

In the provided diagram document, you will see a list of instances of appellations and of things. Try to match the instances to their right class and connect the correct appellation to the correct object with the right property.

Try to find at least one appellation that correctly names an instance of:

- E2 Temporal Entity
- E18 Physical Thing
- E53 Place
- E39 Actor
- E28 Conceptual Object

Draw this in the provided diagram tool, tab 'Lesson 3'.



Source: George x Dall-E

"draw a picture of a sweet girl in a pinafore dress standing in a field on a sunny day staring curiously and pointing at a cube that is floating in the air 10 metres from her"

## Exercise Spreadsheet

[https://drive.google.com/drive/folders/1ukt\\_eLkC\\_HTJRI\\_EWLwEvl\\_a3nMcOjG16?usp=drive\\_link](https://drive.google.com/drive/folders/1ukt_eLkC_HTJRI_EWLwEvl_a3nMcOjG16?usp=drive_link)

## Exercise Diagram

[https://drive.google.com/drive/folders/1q2-9YAVfraqlkyR\\_Qrq8kgwBsMQ\\_sA397?usp=drive\\_link](https://drive.google.com/drive/folders/1q2-9YAVfraqlkyR_Qrq8kgwBsMQ_sA397?usp=drive_link)

# Lesson 3: Learning Outcomes / Review

Natural Language Sentence Types

X is called Y

Basic Formal Language Skill

Connect a documented entity to a name that it has.

Class	Subclass of
E41 Appellation	rdfs:Class

Property	Domain	Range
P1_is_identified_by	E1 CRM Entity	E41 Appellation

# Lesson 4: What kind of thing is that?

# Lesson 4: What kind of thing is that?

*A basic task in any language is to classify the things you are talking about, to indicate what kind of thing it is.*

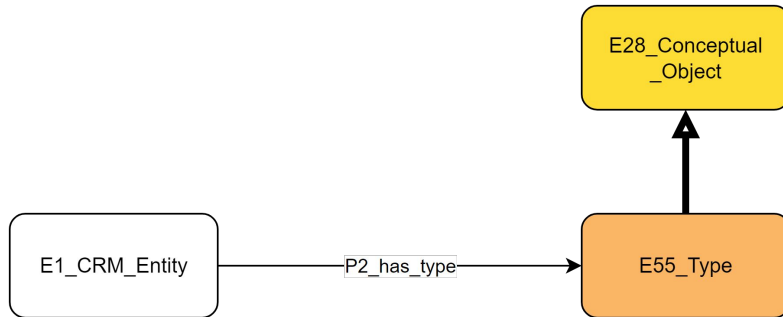
Natural language sentences of this type are of the form

**X is classified as Y.**

X is the thing we want to give the type to.

Y is the type we want to relate to it.

crm:P2\_has\_type allows us to make this statement.

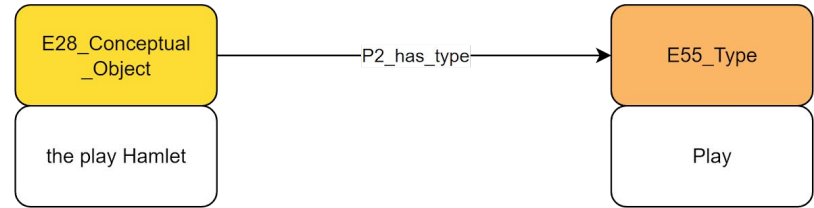
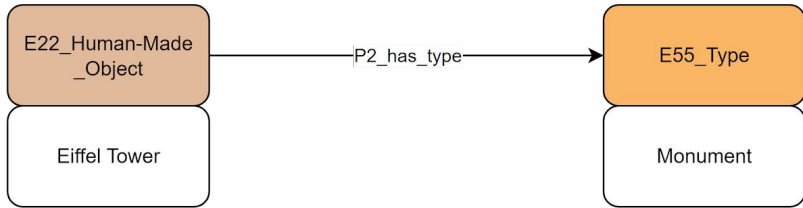
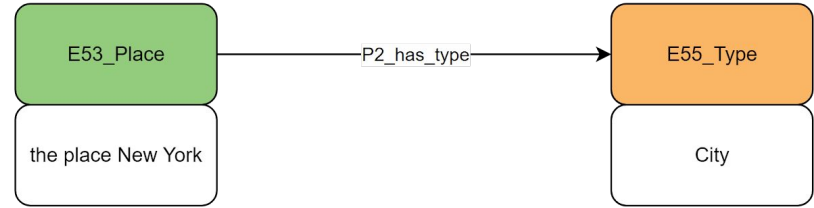
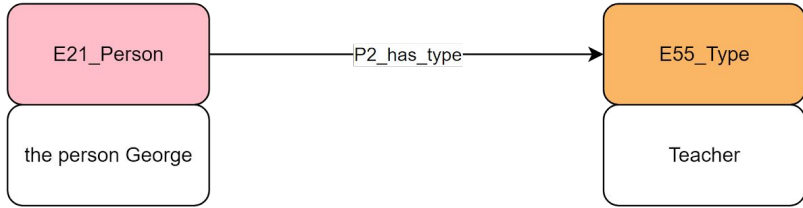
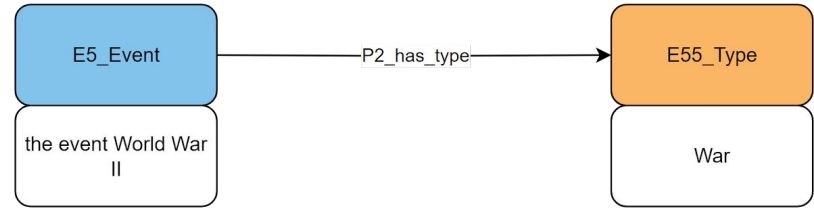
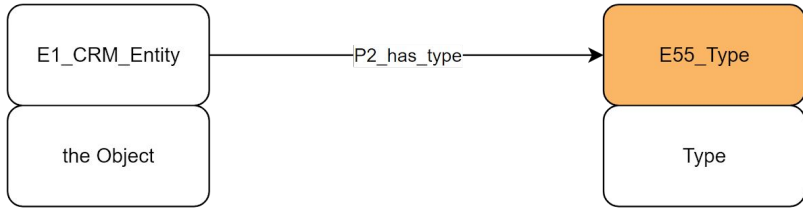


Title: De ascensu et descensu intellectus

Creator: Raimundus Lullus

Source: <https://bit.ly/45v5J6t>

# Lesson 4: Examples



# Exercise 4

In the provided spreadsheet

In the Lesson 4 tab you will see a list of the E28 Conceptual Objects from the total list of Frida Kahlo entities. identify which of these are also E55 Type. Identify as many as you can.

In the provided diagram document, you will see a list of instances of types and of things. Try to match the instances to their right class and connect the correct type to the correct object using the correct property.

Try to find at least one type that correctly classifies an instance of:

- E2 Temporal Entity
- E18 Physical Thing
- E53 Place
- E39 Actor
- E28 Conceptual Object

Draw this in the provided diagram tool, tab 'Lesson 4'.



Source: George x Dall-E

"draw a professor at his desk. The perspective is looking over the shoulder of the professor. The professor stares at a bone on his desk. Also on the desk is an anatomy book. The professor points an an entry in the book. A candle on the desk provides light in the dark room."

## Exercise Spreadsheet

[https://docs.google.com/spreadsheets/d/1dIC-b-q0y0UfMTqBx9Jcc\\_3dqpN1IY2ZWfvr0maqjyQ/edit#gid=889881869](https://docs.google.com/spreadsheets/d/1dIC-b-q0y0UfMTqBx9Jcc_3dqpN1IY2ZWfvr0maqjyQ/edit#gid=889881869)

## Exercise Diagram

[https://drive.google.com/drive/folders/1dZG\\_t9aAcWJGBljvljpZsbVUELQHyS\\_S?usp=drive\\_link](https://drive.google.com/drive/folders/1dZG_t9aAcWJGBljvljpZsbVUELQHyS_S?usp=drive_link)

# Lesson 4: Learning Outcomes / Review

## Natural Language Sentence Types

X is classified as Y  
X is of type Y  
X is of the kind Y

## Basic Formal Language Skill

Connect a documented entity to a type that categorizes it

Class	Subclass of
E55 Type	E28 Conceptual Object

Property	Domain	Range
P2_has_type	E1 CRM Entity	E55 Type



# Lesson 5: What happened?

# Lesson 5: What happened?

*Talking about the past, there are typical sets of facts we want to be able to talk about that answer basic questions. When did that happen? Where did it happen? Who was involved? What was involved? All these questions relate to events in the past and this is how CIDOC CRM allows you to express them, as statements about events.*

Natural language sentences of this type are of the form

**X took place at time Y**

**X took place at place Q**

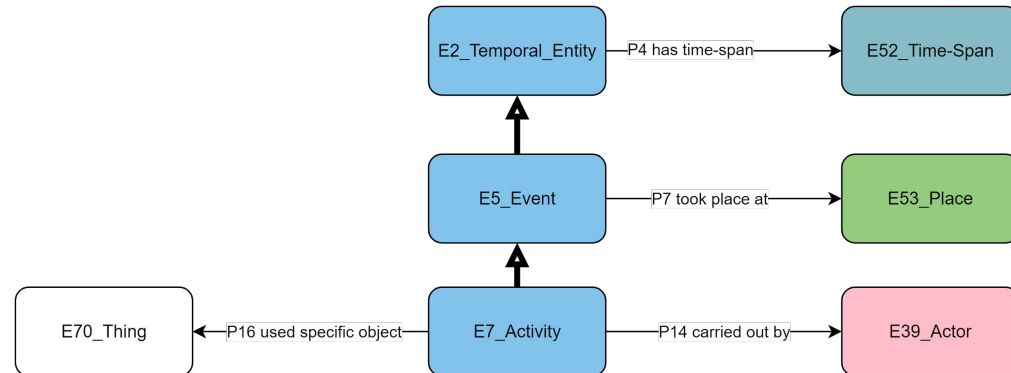
**X involved person P**

**X involved object Z**

Using the event centred representation, CIDOC CRM gives several basic properties which allow you to express these ideas.



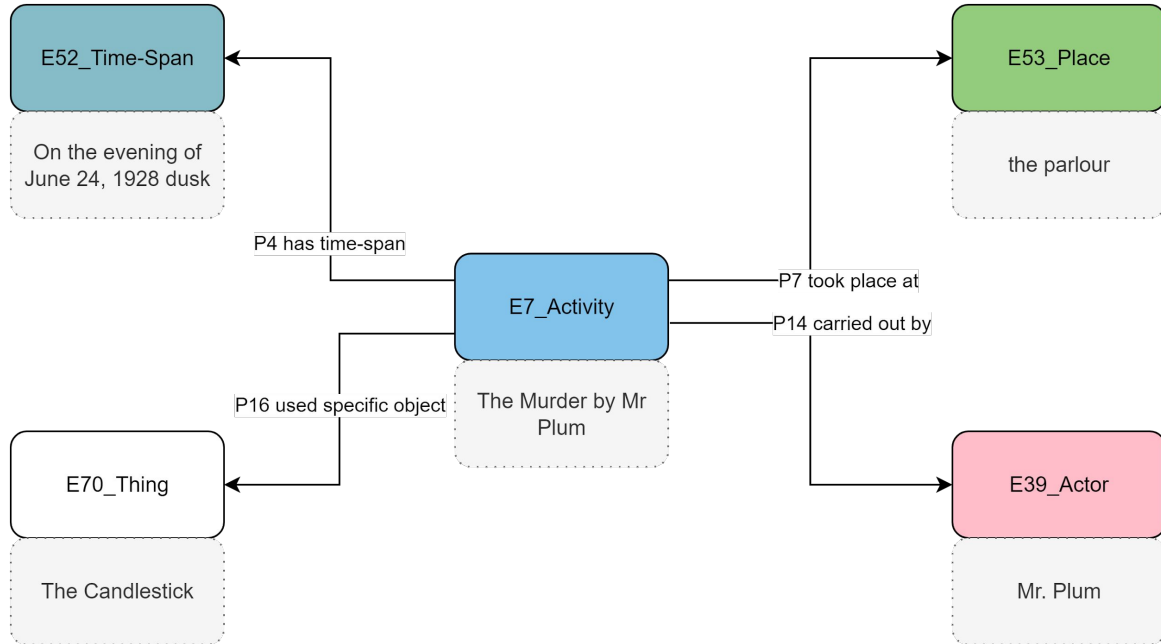
Title: The Drunkenness of Noah  
Creator: Giovanni Bellini  
Source: <https://bit.ly/3qRu3jX>



# Lesson 5: Examples

Consider the following fictional example and its translation to CIDOC CRM formalization.

- The murder took place on the evening of June 24, 1928, at dusk.
- The murder took place in the parlour.
- The murder was carried out by Mr Plum. (Mr Plum was the murderer)
- The murder used the candlestick. (The candlestick was the murder weapon)



# Exercise 5a

On the provided diagram tool, in the tab '**Toolkit**', you will find a collection of instances, classes and properties which can be used to semantically represent the marriage of Frida Kahlo and Diego Rivera. On the tab '**Example**' you will see how other activities have been modelled. In the tab '**AnswerSpace**' you can make your semantic model.

Put together the instances, classes and properties in such a way that you describe the facts that:

Frida Kahlo and Diego Rivera were married in Coyoacan in 1929, exchanging their wedding rings.



Source: <https://www.contexttravel.com/blog/articles/frida-kahlo-diego-rivera-life-story>

**Exercise Diagram**

[https://drive.google.com/drive/folders/1bml9fbN9Yd\\_06Zueuyc9MYa\\_BySgQCWV?usp=drive\\_link](https://drive.google.com/drive/folders/1bml9fbN9Yd_06Zueuyc9MYa_BySgQCWV?usp=drive_link)

## Exercise 5b

On the provided diagram tool, tab '**Toolkit**', you will find a collection of instances, classes and properties which can be used to semantically represent the event of Frida's painting of the "Frieda and Diego Rivera - painting". On the tab '**Example**' you will see how other activities have been modelled. In the tab '**AnswerSpace**' you can make your semantic model.

Put together the instances, classes and properties in such a way that you describe the facts that:

Frida Kahlo painted "Frieda and Diego Rivera" in San Francisco in 1931 using her paintbrush.



**Title:** Frida and Diego Rivera

**Creator:** Frida Kahlo

**Source:** <https://bit.ly/47RxGqC>

### Exercise Diagram

[https://drive.google.com/drive/folders/1u4lkGWmtPbFdt\\_OXeSCHAg0u6i34uwzk?usp=drive\\_link](https://drive.google.com/drive/folders/1u4lkGWmtPbFdt_OXeSCHAg0u6i34uwzk?usp=drive_link)

# Lesson 5: Learning Outcomes / Review

## Natural Language Sentence Types

X took place at time Y  
X took place at place Q  
X involved person P  
X involved object Z

## Basic Formal Language Skill

Choose an appropriate property to express your meaning

Choose the correct domain class in order to be able to use your property.

Class	Subclass of
E5 Event	E2 Temporal Entity
E7 Activity	E5 Event

Property	Domain	Range
P4_has_time-span	E2 Temporal Entity	E52 Time-Span
P7_took_place_at	E5 Event	E53 Place
P14 carried out by	E7 Activity	E39 Actor
P16_used_specific_object	E7 Activity	E70 Thing

# Lesson 6: Telling Time

# Lesson 6: Telling Time

*Talking about time, there are typical sets of facts we want to be able to talk about that answer basic questions. When did that event start? When did it end? How long did it go on for?*

Natural language sentences of this type are of the form

**X happened at time Y**

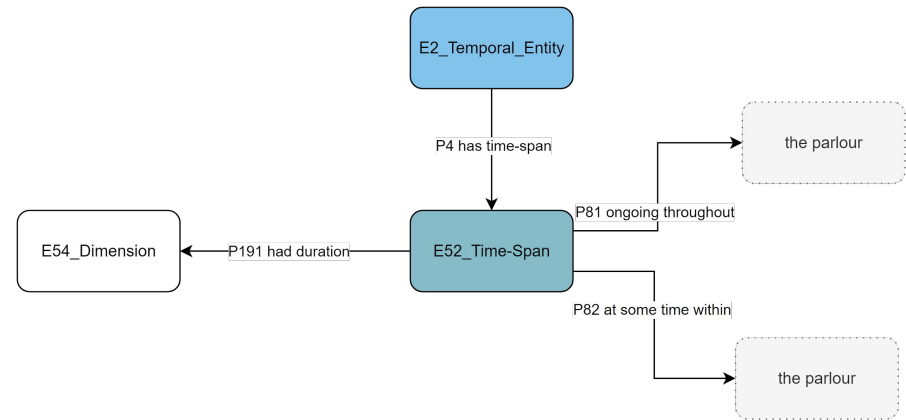
**X happened within time Q**

**X was ongoing for Z time**

We can express these sentences with a few CIDOC CRM predicates.



Title: The Persistence of Memory  
Creator: Salvador Dali  
Source: <https://bit.ly/3R09f4f>





# Lesson 6: Telling Time Examples

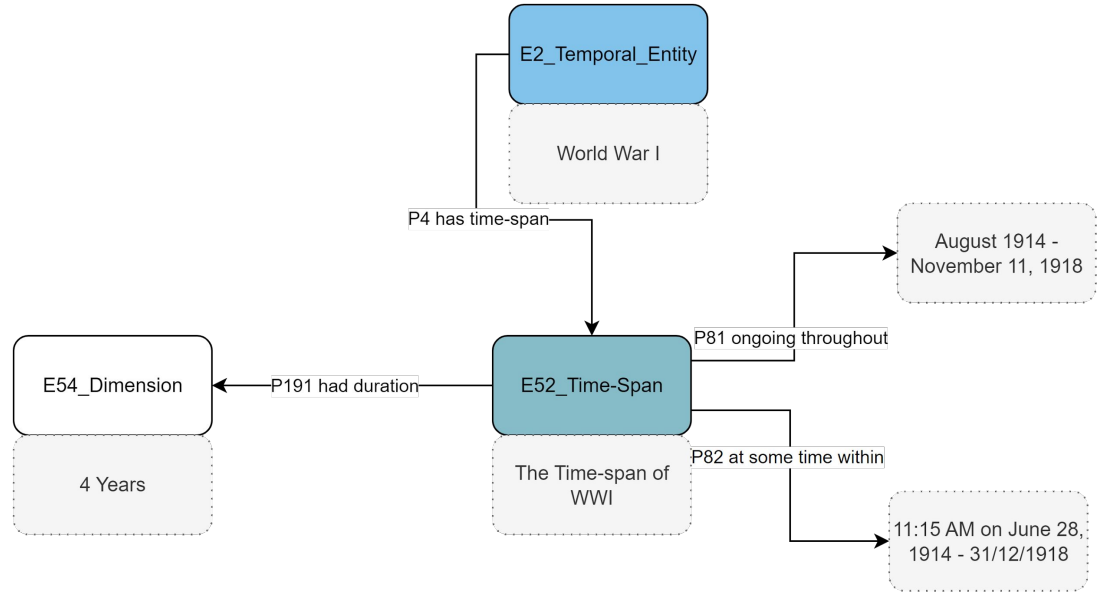
Consider the following example and its translation to CIDOC CRM formalization.

World War I began with the assassination of Duke Ferdinand 11:15 AM on June 28, 1914

World War I ended with the Armistice signed on November 11, 1918

World War I took place from 1914-1918.

World War I lasted four years.



# Exercise 6

On the provided diagram tool, tab '**Toolkit**', you will find a collection of instances, classes and properties which can be used to semantically represent the possible birth dates of Frida Kahlo. On the tab '**Example**' you will see how other activities have been modelled. In the tab '**AnswerSpace**' you can make your semantic model.

Put together the instances, classes and properties in such a way that you describe the facts that:

The Birth of Frida Kahlo occurred at some time within 1907-1910 but was definitely happening on July 6, 1907.



Title: My Birth  
Creator: Frida Kahlo  
Source:  
<https://www.wikiart.org/en/frida-kahlo/my-birth-1932>

## Exercise Diagram

[https://drive.google.com/drive/folders/1MQVWrMhp89v1BnHMHv2kD4bgvK6UKaSO?usp=drive\\_link](https://drive.google.com/drive/folders/1MQVWrMhp89v1BnHMHv2kD4bgvK6UKaSO?usp=drive_link)

# Lesson 6: Learning Outcomes / Review

## Natural Language Sentence Types

X took definitely took place from time A to B  
X took place between time A and B  
X had a temporal duration of Y

## Basic Formal Language Skill

Make a complex sentence (two hops)  
Express time as intervals, not points

Class	Subclass of
E52 Time-Span	E1 CRM Entity
E61 Time-Primitive	E59 Primitive Value

Property	Domain	Range
P81_ongoing_throughout	E52 Timespan	E61 Time Primitive
P82_at_some_time_within	E52 Timespan	E61 Time Primitive
P191_had_duration	E52 Timespan	E54 Dimension

# Lesson 7: Describing the Physical

# Lesson 7: Describing the Physical

*Much work carried out in cultural heritage contexts has to do with the description of physical objects cared for or observed by curators.*

Natural language sentences about the materiality of physical objects that can be described by CRM include:

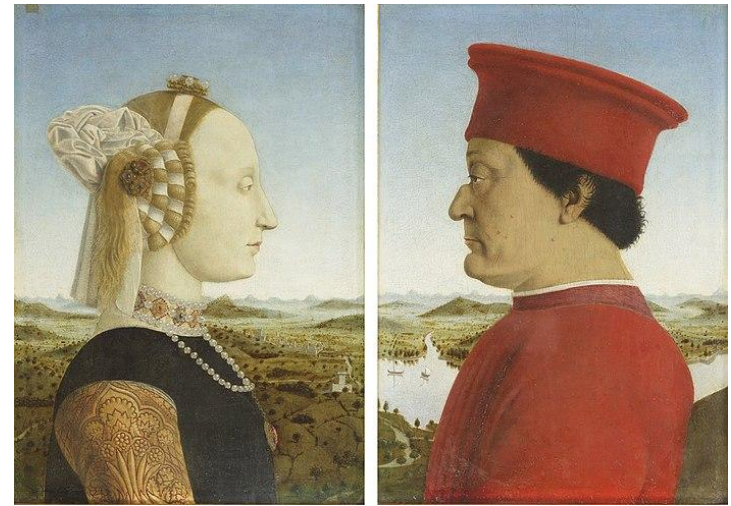
**X is made of material Y**

**X has Q Dimension**

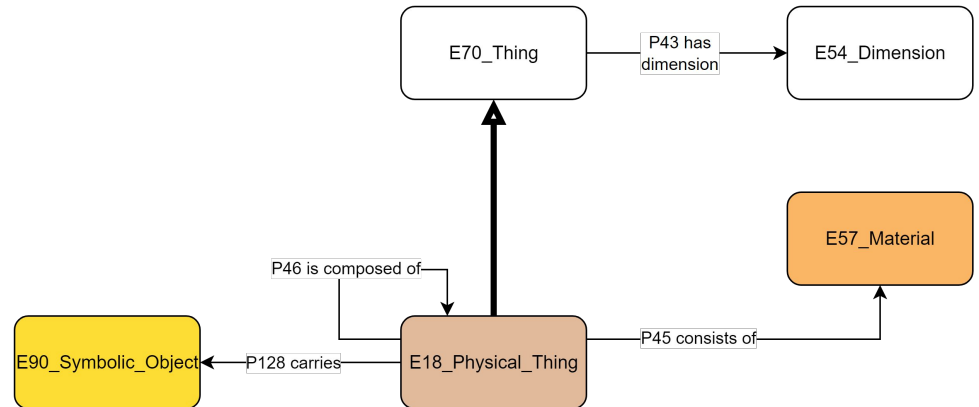
**X is part of Z**

**X bears the content P**

We can express these sentences with a few CIDOC CRM predicates.



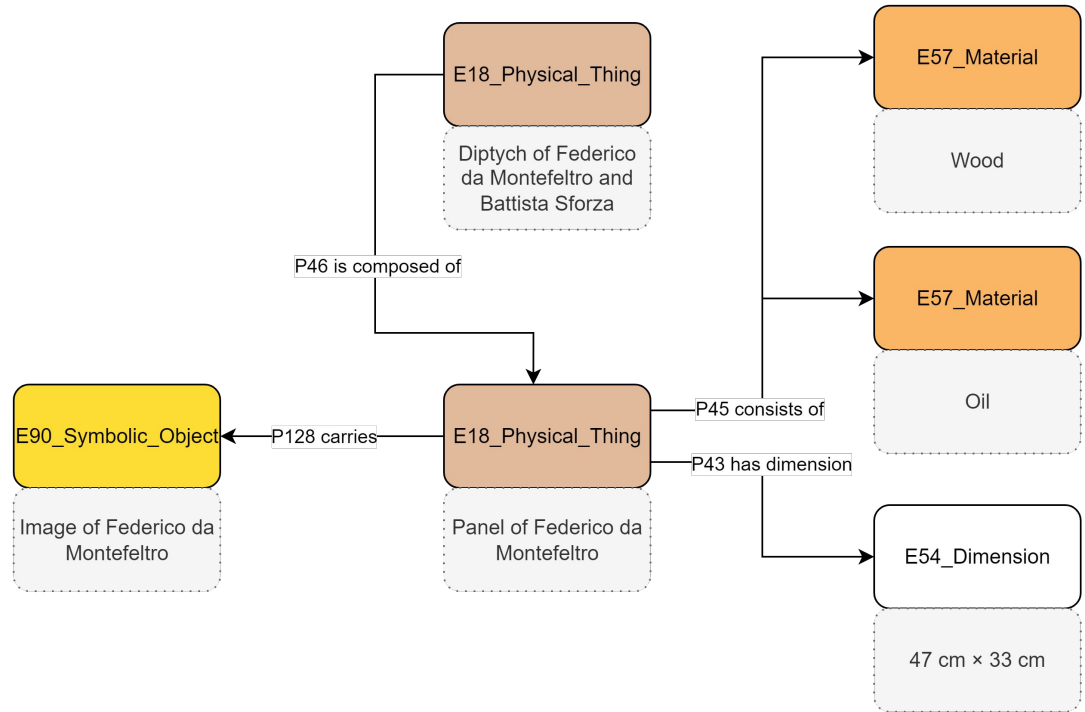
Title: Diptych of Federico da Montefeltro and Battista Sforza  
Creator: Piero della Francesca  
Source: <https://bit.ly/3aQcuRc>



# Lesson 7: Examples

Consider the following example and its translation to CIDOC CRM formalization.

- Panel of Federico da Montefeltro is materially composed of Oil and Wood
- Panel of Federico da Montefeltro has the dimension 47 cm × 33 cm
- Panel of Federico da Montefeltro is part of The Diptych of F and B
- Panel of Federico da Montefeltro bears the image of Federico da Montefeltro



# Exercise 7a

On the provided diagram tool, tab '**Toolkit**', you will find a collection of instances, classes and properties which can be used to semantically represent some key physical traits of the painting "Frieda and Diego Rivera". On the tab '**Example**' you will see how other physical things have been modelled. In the tab '**AnswerSpace**' you can make your semantic model.

Put together the instances, classes and properties in such a way that you describe the facts that:

The painting "Frieda and Diego Rivera" is oil on canvas and measures "100.01 cm × 78.74 cm (39.37 in × 31.00 in)" and shows the image of "Frieda and Diego Rivera".



**Title:** Frida and Diego Rivera

**Creator:** Frida Kahlo

**Source:** <https://bit.ly/47RxGqC>

## Exercise Diagram

[https://drive.google.com/drive/folders/1c1bJPnbf5uDBxbNpTL6gdELNGwMj2mLg?usp=drive\\_link](https://drive.google.com/drive/folders/1c1bJPnbf5uDBxbNpTL6gdELNGwMj2mLg?usp=drive_link)

## Exercise 7b

On the provided diagram tool, tab '**Toolkit**', you will find a collection of instances, classes and properties which can be used to semantically represent some key physical traits of the painting "Fantasmones Siniestros". On the tab '**Example**' you will see how other physical things have been modelled. In the tab '**AnswerSpace**' you can make your semantic model.

Put together the instances, classes and properties in such a way that you describe the facts that:

The painting "Fantasmones Siniestros" is watercolour on paper, forms part of the Frida Kahlo Diary, and shows the image of "Fantasmones Siniestros".



Source: <https://pinupartrecycle.com/why-burns-a-frida-kahlo-for-gifts-was-such-a-spectacular-failure/#:~:text=Made%20by%20Kahlo%20in%201945,frida%20kahlo%20diary>

### Exercise Diagram

[https://drive.google.com/drive/folders/167reUDhWTJNrmjyaYn05LvvJtXgsOO6z?usp=drive\\_link](https://drive.google.com/drive/folders/167reUDhWTJNrmjyaYn05LvvJtXgsOO6z?usp=drive_link)



# Lesson 7: Learning Outcomes / Review

## Natural Language Sentence Types

X is made of material Y  
X has Q Dimension  
X is part of Z  
X bears the content P

Class	Subclass of
E18 Physical Thing	E72 Legal Object
E57 Material	E55 Type

## Basic Formal Language Skill

Express parthood appropriately

Property	Domain	Range
P43_has_dimension	E70_Thing	E54 Dimension
P45_consists_of	E18_Physical_Thing	E57 Material
P46_is_composed_of	E18_Physical_Thing	E18_Physical_Thing
P128_carries	E18_Physical_Thing	E90 Symbolic Object

# Lesson 8: Describing the Conceptual

# Lesson 8: Describing the Conceptual

*Much work carried out in cultural heritage contexts has to do with the description of the conceptual objects that are carried by physical works and which communicate meaning and information to their observers.*

Natural language sentences about conceptual objects that can be described by CRM include:

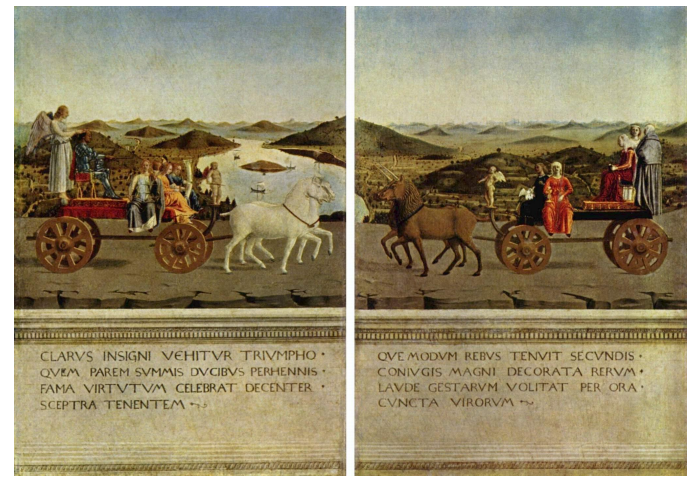
**X refers to Y**

**X has content Q**

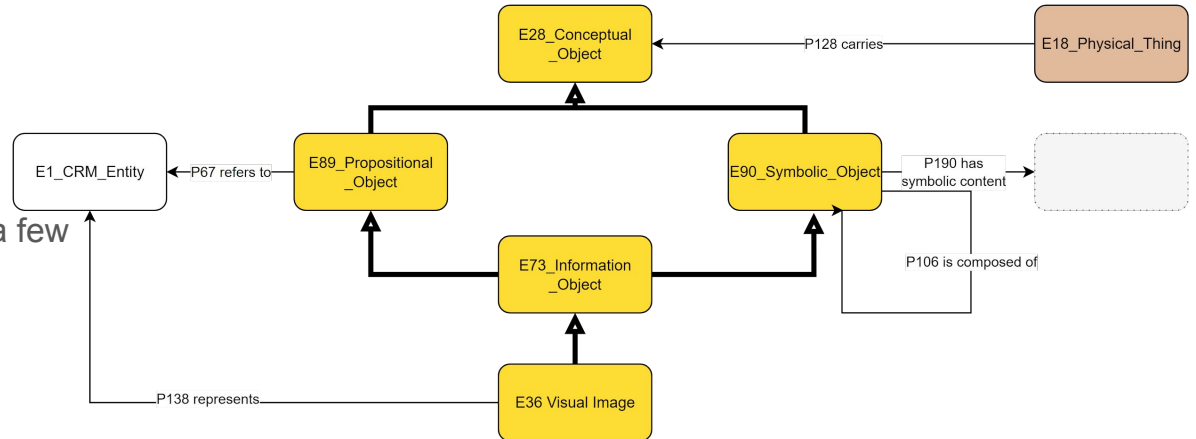
**X visually shows P**

**X is composed of S**

We can express these sentences with a few CIDOC CRM predicates.



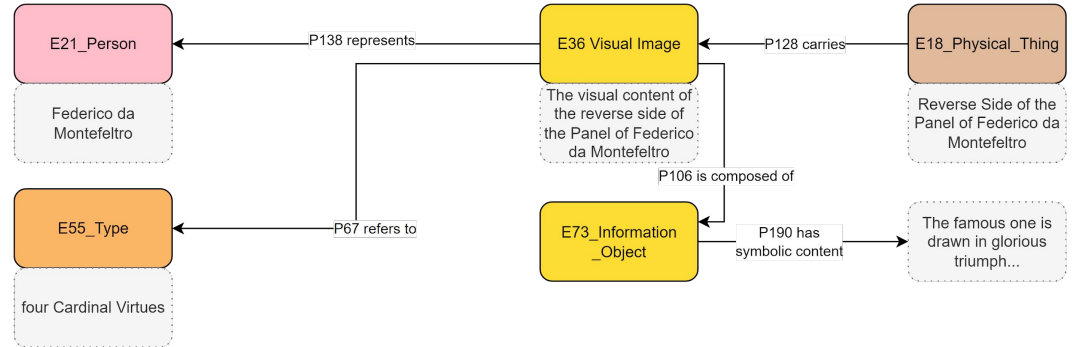
Title: Diptych of Federico da Montefeltro and Battista Sforza  
Creator: Piero de la Francesca  
Source: <https://bit.ly/3qQcuRc>



# Lesson 8: Examples

Consider the following example and its translation to CIDOC CRM formalization.

- The image on the reverse of the Panel of Federico da Montelfetro refers to the Four Cardinal Virtues
- The image visually shows Federico da Montelfreto
- The image has an inscription component
- The inscription on the image contains the passage “The famous one is drawn in glorious triumph”

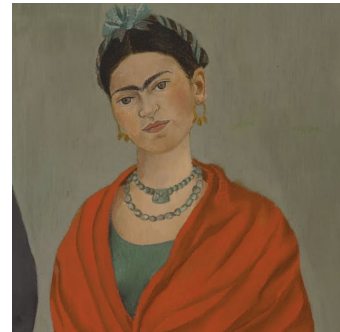
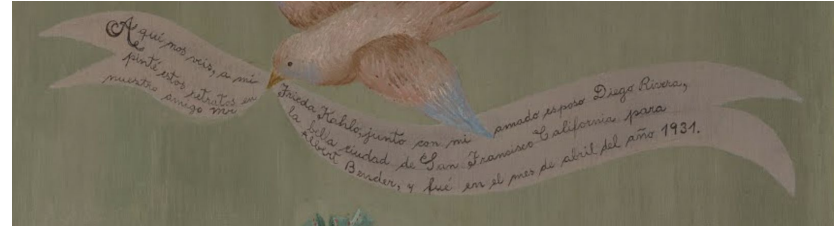


# Exercise 8

On the provided diagram tool, tab **'Toolkit'**, you will find a collection of instances, classes and properties which can be used to semantically represent the intellectual content of the painting "Frida and Diego Rivera". On the tab **'Example'** you will see how other conceptual things have been modelled. In the tab **'AnswerSpace'** you can make your semantic model.

Put together the instances, classes and properties in such a way that you describe the facts that:

The image of the painting "Frida and Diego Rivera" is composed of an image of Frida Kahlo, an image of Diego Rivera and an image of a banner. These images show the real persons Frida Kahlo and Diego Rivera and refers to their wedding. The image of the banner contains the following text, "Aquí nos veis, a mí, Frida Kahlo, junto con mi amado esposo Diego Rivera. Pinté estos retratos en la bella ciudad de San Francisco, California, para nuestro amigo Mr. Albert Bender, y fue en el mes de abril del año 1931"



**Title:** Frida and Diego Rivera

**Creator:** Frida Kahlo

**Source:** <https://bit.ly/47RxGqC>

## Exercise Diagram

[https://drive.google.com/drive/folders/13OJz1hJUth9d5XGwXPcTCgMuzfjlyFqu?usp=drive\\_link](https://drive.google.com/drive/folders/13OJz1hJUth9d5XGwXPcTCgMuzfjlyFqu?usp=drive_link)

# Lesson 8: Learning Outcomes / Review

## Natural Language Sentence Types

X refers to Y  
 X has content Q  
 X visually shows P  
 X is composed of S

## Basic Formal Language Skill

Express reference and aboutness

Express structural parthood of conceptual objects

Class	Subclass of
E28 Conceptual Object	E71 Human-Made Thing
E89 Propositional Object	E28 Conceptual Object
E90 Symbolic Object	E28 Conceptual Object
E73 Information Object	E89 Propositional Object, E90 Symbolic Object
E36 Visual Image	E73 Information Object

Property	Domain	Range
P67 refers to	E89 Propositional Object	E1 CRM Entity
P106 is composed of	E90 Symbolic Object	E90 Symbolic Object
P138 represents	E36 Visual Item	E1 CRM Entity
P190 has symbolic content	E90 Symbolic Object	E62 String

# Lesson 9: Talking about Endings and Beginnings

# Lesson 9: Talking about Endings and Beginnings

*The description of how and when something came to be or went out of existence is a basic part of describing the historicity of things in CH.*

Natural language sentences about the coming to be and passing away of things that CRM covers include:

**X came to be in event Y**

**X ceased to be in event Q**

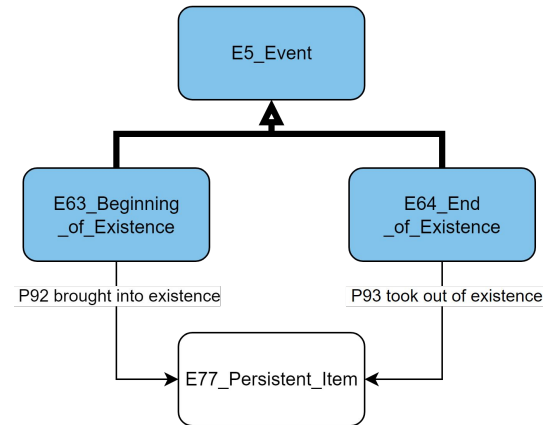
The sentences begin from temporal entity classes meaning that we can enrich what we want to say by also making sentences about who / what / when.



Title: Washington Crossing the Delaware

Creator: Emanuel Leutze

Source: <https://bit.ly/45QXtNN>

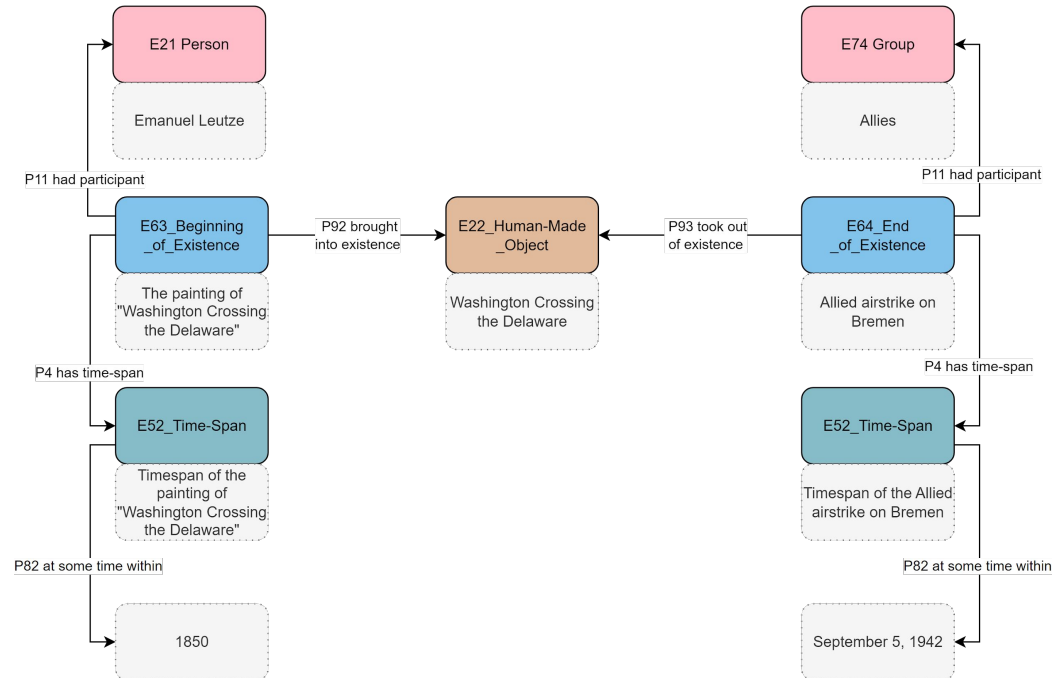




# Lesson 9: Examples

Consider the following example and its translation to CIDOC CRM formalization.

- “Washington Crossing the Delaware” came to be through its painting
- Its painting occurred in 1850
- It was painted by Emanuel Leutze
- It was destroyed in an allied airstrike
- The airstrike took place sep 5, 1942
- The strike was carried out by the allies



# Exercise 9

On the provided diagram tool, tab '**Toolkit**', you will find a collection of instances, classes and properties which can be used to semantically represent the origin and end events of the painting "Fantasmones Siniestros". On the tab '**Example**' you will see how other beginnings and endings have been modelled. In the tab '**AnswerSpace**' you can make your semantic model.

Put together the instances, classes and properties in such a way that you describe the facts that:

The painting "Fantasmones Siniestros" was painted by Frida Kahlo in the period 1945-1954 and was destroyed by Martin Mobarak in July, 2022.



Source: <https://pouulturecivoto.com/why-burns-a-frida-kahlo-for-gifts-was-such-a-spectacular-failure/#~:text=Made%20by%20Kahlo%20in%201945,the%20revenge%20took%20on%20the>

## Exercise Diagram

[https://drive.google.com/drive/folders/1q-QuNwMDfcL21alwGnB57\\_UtkS9RbhSM?usp=drive\\_link](https://drive.google.com/drive/folders/1q-QuNwMDfcL21alwGnB57_UtkS9RbhSM?usp=drive_link)

# Lesson 9: Learning Outcomes / Review

## Natural Language Sentence Types

X came to be in event Y  
X ceased to be in event Q

## Basic Formal Language Skill

Use properties from superclasses in order to enrich what one can say

Class	Subclass of
E63 Beginning of Existence	E5 Event
E64 End of Existence	E5 Event

Property	Domain	Range
P92 brought out of existence	E63 Beginning of Existence	E77 Persistent Item
P93 took out of existence	E64 End of Existence	E77 Persistent Item

# Lesson 10: Where is / was that?

# Lesson 10: Where is/was that?

*Locating events and things in space is a key discursive element of CH discourse.*

Natural language sentences about location that CRM covers include:

**X was the place of event Y**

**X is/was the location of object S**

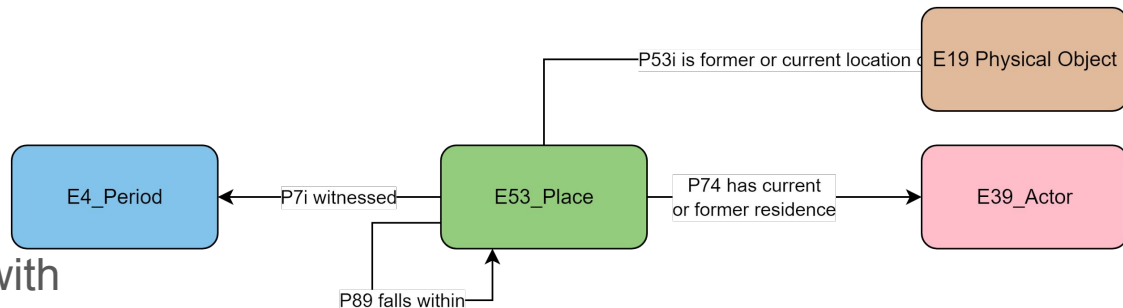
**X is/was the location of actor P**

**X is part of place T**

We can express these sentences with a few CIDOC CRM predicates.



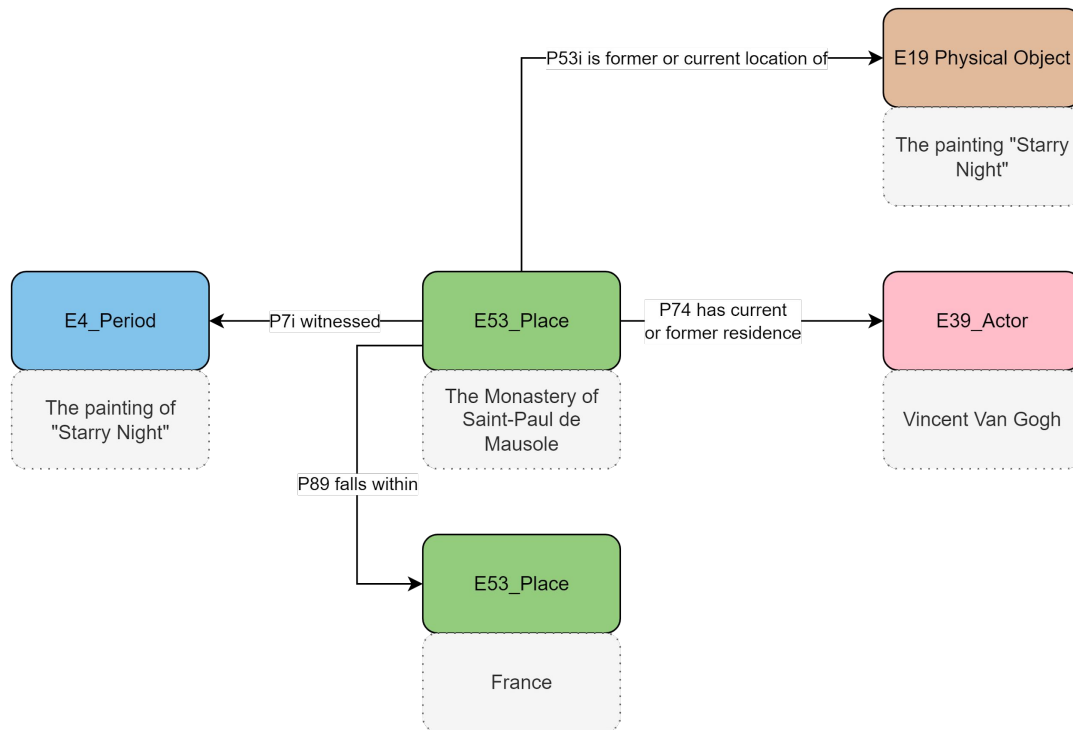
Title: Starry Night  
Creator: Van Gogh  
Source: <https://bit.ly/3sF90kY>



# Lesson 10: Where is/was that?

Consider the following example and its translation to CIDOC CRM formalization.

- The Monastery of St Paul De Mausole was the place of painting of Starry Night.
- The Monastery was once the location of the painting Starry Night.
- The Monastery was once the residence of Vincent Van Gogh
- The Monastery is in France.

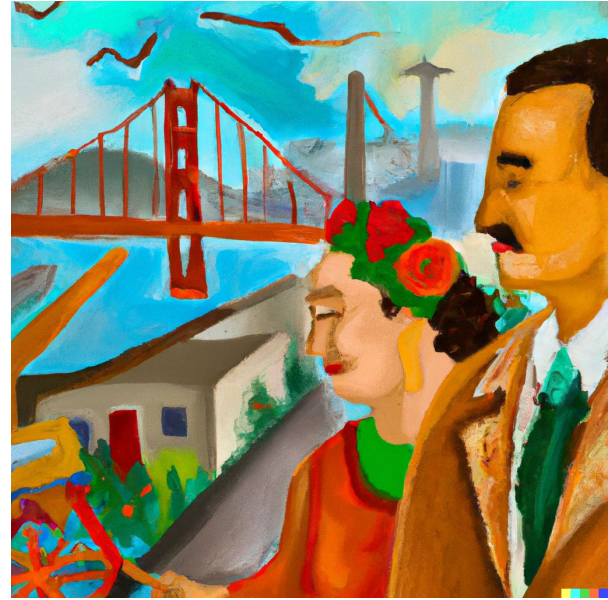


# Exercise 10

On the provided diagram tool, tab **'Toolkit'**, you will find a collection of instances, classes and properties which can be used to semantically represent art historical information about San Francisco. On the tab **'Example'** you will see how other beginnings and endings have been modelled. In the tab **'AnswerSpace'** you can make your semantic model.

Put together the instances, classes and properties in such a way that you describe the facts that:

San Francisco is part of the United States and was one time home to both Frida Kahlo and also her painting "Frieda and Diego Rivera". It was in fact the site of her painting of that famous work.



Source: George x Dall-E

"paint a painting in the style of Frida Kahlo of Frida Kahlo and Diego Rivera strolling through San Francisco with the Golden Gate Bridge in the background"

## Exercise Diagram

[https://drive.google.com/drive/folders/14bFEXOdyu\\_Nc1BPAZAnzsarTotMloBL-?usp=drive\\_link](https://drive.google.com/drive/folders/14bFEXOdyu_Nc1BPAZAnzsarTotMloBL-?usp=drive_link)

# Lesson 10: Where is/was that?

## Natural Language Sentence Types

X was the place of event Y  
X is/was the location of object S  
X is/was the location of actor P  
X is part of place T

Class	Subclass of
E53 Place	E1 CRM Entity

## Basic Formal Language Skill

Inverse properties

Proper parthood places

Property	Domain	Range
P7i witnessed	E53 Place	E4 Period
P53i is former or current location of	E53 Place	E19 Physical Object
P74 has current or former residence	E53 Place	E39 Actor
P89 falls within	E53 Place	E53 Place



# End Of Level A1

Questions: George Bruseker (george@takin.solutions)

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