National Gallery of Art

Linked Art Guide

The National Gallery of Art's Open Data Program provides a repository containing 17 published relational database tables in csv format. This guide provides an overview of how these files can be navigated in order to represent the data according to the Linked Art API (version 0.8.0). The Linked Art framework is a subset of Linked Open Data, which is itself a subset of Linked Data, and uses the JSON-LD format for object serialization. The Linked Art website provides many examples of how particular entities and their attributes should be represented as JSON-LD files, and this guide demonstrates how that translates to particular fields in the NGA's data set. This guide is not meant to be exhaustive, but rather covers some of the most common use cases that are encountered in assembling Linked Art representations from the NGA's public data set.

The following pages contain embedded snippets of sample JSON-LD representations for particular Linked Art patterns. Full JSON-LD examples for a few pieces can be found externally to accompany this guide. The first section will outline how to create Linked Art representations using only the fields in **objects.csv**. Later sections describe how these baseline representations can be expanded by connecting the objects in **objects.csv** to other files in the repository using the relationships between primary and foreign keys. Some special cases are covered in the final section.

objects.csv

The **objects.csv** file contains the bulk of the NGA's public collection data, with individual entries for over 130,000 objects in the NGA's collection.

The following fields are included for each object:

objectid	attribution
accessioned	creditline
accessionnum	classification
locationid	subclassification
title	visualbrowserclassification
displaydate	parentid
beginyear	isvirtual
endyear	departmentabbr
visualbrowsertimespan	portfolio
medium	series
dimensions	volume
inscription	watermarks
markings	lastdetectedmodification
attributioninverted	customprinturl

This section will describe how to construct Linked Art representations using a majority of these fields in the general case. The general case is that of a physical (i.e. non-virtual) object in the NGA's collection that does not have excessively complex attributes. Later sections will show how these representations can be bulked up with supplementary data found in other tables as well as how to handle certain objects that do not fit the general case.

Minimum Representation

The LinkedArt API defines the schema for a Human-Made Object [here](#). All Human-Made Objects should include, at minimum, the following fields:

@context: The Linked Art context URI
id: the URI of the entity
type: the class of the entity
_label: a human readable name for the entity

Using fields from **objects.csv** (in yellow text), the minimum JSON-LD representation can be formatted as follows:

```
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": " https://www.nga.gov/collection/art-object-page.objectid.html",
    "type": "HumanMadeObject",
    "_label": "title"
}
```

Below is an example of this minimum representation using Leonardo da Vinci's *Ginevra de' Benci [obverse]*, c. 1474/1478. This work will be used to model several examples to follow. Note how the yellow fields from the minimum representation were replaced with their corresponding values in **objects.csv** for this work, which has an objectid of 50724 and a title of "Ginevra de' Benci [obverse]."

```
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": "https://www.nga.gov/collection/art-object-page.50724.html",
    "type": "HumanMadeObject",
    "_label": "Ginevra de' Benci [obverse]"
}
```

Classification

Most entries in **objects.csv** are classified into a general medium category (painting, print, sculpture, photograph, etc.) in the classification field. These classifications should be associated with a corresponding URI from the [Getty Vocabulary](#).

The general format is as follows, where the fields from **objects.csv** are in yellow text and the URI from the Getty Vocabulary is in purple text:

```
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": "https://www.nga.gov/collection/art-object-page.objectid.html",
    "type": "HumanMadeObject",
    "_label": "title",
    "classified_as": [
        {
            "id": "http://vocab.getty.edu/...",
            "type": "Type",
            "_label": "classification"
        }
    ]
}
```

The JSON below continues the general example for Leonardo's *Ginevra de' Benci [obverse]*, which has a classification of "Painting". Note how the purple text has been replaced with a full URI corresponding to the concept of paintings in the Getty Vocabulary.

```json
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": "https://www.nga.gov/collection/art-object-page.50724.html",
    "type": "HumanMadeObject",
    "_label": "Ginevra de' Benci [obverse]",
    "classified_as": [
        {
            "id": "http://vocab.getty.edu/aat/300033618",
            "type": "Type",
            "_label": "Painting"
        }
    ]
}
```

It is not uncommon for a work to have both a classification and a subclassification. Examples include an object that has a primary classification of "sculpture" and a subclassification of "statue" or an object that is classified as "decorative art" with a subclassification of "furniture." These cases can generally be represented as done below, where the purple text should be replaced with the appropriate URI for the classification and subclassification.

```json
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": "https://www.nga.gov/collection/art-object-page.objectid.html",
    "type": "HumanMadeObject",
    "_label": "title",
    "classified_as": [
        {
            "id": "http://vocab.getty.edu/...",
            "type": "Type",
            "_label": "classification"
        },
        {
            "id": "http://vocab.getty.edu/...",
            "type": "Type",
            "_label": "subclassification"
        }

    ]
}
```

Identification

Entries in **objects.csv** can be uniquely identified by the object ID and/or accession number. The title of the work also identifies the object, although it will not necessarily be unique. The general case is shown below. Note that URIs are supplied to specify the type of identifier, and that these do not need to be changed when filling in the yellow fields with data.

```json
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": "https://www.nga.gov/collection/art-object-page.objectid.html",
    "type": "HumanMadeObject",
    "_label": "title",
    "identified_by": [
        {
            "type": "Name",
            "classified_as": [
                {
                    "id": "http://vocab.getty.edu/aat/300404670",
                    "type": "Type",
                    "_label": "Primary Name"
                }
            ],
            "content": "title"
        },
        {
            "type": "Identifier",
            "classified_as": [
                {
                    "id": "http://vocab.getty.edu/aat/300312355",
                    "type": "Type",
                    "_label": "Accession Number"
                }
            ],
            "content": "accessionnum"
        },
        {
            "type": "Identifier",
            "classified_as": [
                {
                    "id": "http://vocab.getty.edu/aat/300404626",
                    "type": "Type",
                    "_label": "Identification Numbers"
                }
            ],
            "content": "objectid"
        }
    ]
}
```

Continuing the example for *Ginevra de' Benci*:

```json
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": "https://www.nga.gov/collection/art-object-page.50724.html",
    "type": "HumanMadeObject",
    "_label": "Ginevra de' Benci [obverse]",
    "identified_by": [
        {
            "type": "Name",
            "classified_as": [
                {
                    "id": "http://vocab.getty.edu/aat/300404670",
                    "type": "Type",
                    "_label": "Primary Name"
                }
            ],
            "content": "Ginevra de' Benci [obverse]"
        },
        {
            "type": "Identifier",
            "classified_as": [
                {
                    "id": "http://vocab.getty.edu/aat/300312355",
                    "type": "Type",
                    "_label": "Accession Number"
                }
            ],
            "content": "1967.6.1.a"
        },
        {
            "type": "Identifier",
            "classified_as": [
                {
                    "id": "http://vocab.getty.edu/aat/300404626",
                    "type": "Type",
                    "_label": "Identification Numbers"
                }
            ],
            "content": "50724"
        }
    ]
}
```

Production

Relevant fields pertaining to the production of objects in **objects.csv** include the attribution of the work and the time frame. The URI for the attributed artist can again be obtained from the Getty vocabulary.

```json
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": " https://www.nga.gov/collection/art-object-page.objectid.html",
    "type": "HumanMadeObject",
    "_label": "title",
    "produced_by": {
        "type": "Production",
        "timespan": {
          "type": "TimeSpan",
          "begin_of_the_begin": "beginyear-01-01T00:00:00Z",
          "end_of_the_end": "endyear-01-01T00:00:00Z"
        },
        "carried_out_by": [
            {
                "id": "http://vocab.getty.edu/...",
                "type": "Person",
                "_label": "attribution"
            }
        ]
    }

}
```

For example, with Leonardo da Vinci as the creator of *Ginevra de' Benci*:

```json
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": "https://www.nga.gov/collection/art-object-page.50724.html",
    "type": "HumanMadeObject",
    "_label": "Ginevra de' Benci [obverse]",
    "produced_by": {
        "type": "Production",
        "timespan": {
          "type": "TimeSpan",
          "begin_of_the_begin": "1474-01-01T00:00:00Z",
          "end_of_the_end": "1478-01-01T00:00:00Z"
        },
        "carried_out_by": [
            {
                "id": "http://vocab.getty.edu/ulan/500010879",
                "type": "Person",
                "_label": "Leonardo da Vinci"
            }
        ]
    }
}
```

If there are multiple artists, the production activity should be broken into separate parts for each contributor. Note that in **objects.csv** all contributors are grouped into the single attribution field. For example, consider *The Feast of the Gods*, attributed to both Giovanni Bellini and Titian:

```json
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": "https://www.nga.gov/collection/art-object-page.1138.html",
    "type": "HumanMadeObject",
    "_label": "The Feast of the Gods",
    "produced_by": {
      "type": "Production",
      "timespan": {
        "type": "TimeSpan",
        "begin_of_the_begin": "1514-01-01T00:00:00Z",
        "end_of_the_end": "1529-01-01T00:00:00Z"
      },
      "part": [
        {
          "type": "Production",
          "carried_out_by": [
            {
              "id": "http://vocab.getty.edu/ulan/500019244",
              "type": "Person",
              "_label": "Giovanni Bellini"
            }
          ]
        },
        {
          "type": "Production",
          "carried_out_by": [
            {
              "id": "http://vocab.getty.edu/ulan/500031075",
              "type": "Person",
              "_label": "Titian"
            }
          ]
        }
      ]
    }
}
```

There are many more nuanced cases that may be occasionally encountered in the data. This includes situations in which a work is attributed to an artist's workshop rather the artist themselves, works done "after" another artist, or works with unknown or changing attributions. Some of these cases are covered in the Linked Art Production Documentation.

Dimensions

Dimensions can be a bit tricky. In the ideal and most simple case, they could be broken down simply to a height and a width as done below:

```
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": " https://www.nga.gov/collection/art-object-page.objectid.html",
    "type": "HumanMadeObject",
    "_label": "title",
    "dimension": [
        {
            "type": "Dimension",
            "classified_as": [
                {
                    "id": "http://vocab.getty.edu/aat/300055647",
                    "type": "Type",
                    "_label": "Width"
                }
            ],
            "value": dimensions.width,
            "unit": {
                "id": "http://vocab.getty.edu/aat/300379100",
                "type": "MeasurementUnit",
                "_label": "inches"
            }
        },
        {
            "type": "Dimension",
            "classified_as": [
                {
                    "id": "http://vocab.getty.edu/aat/300055644",
                    "type": "Type",
                    "_label": "Height"
                }
            ],
            "value": dimensions.height,
            "unit": {
                "id": "http://vocab.getty.edu/aat/300379100",
                "type": "MeasurementUnit",
                "_label": "inches"
            }
        }
    ]

}
```

However, many entries in **objects.csv** have more complex dimensions statements. This may include multiple types of measurements, multiple units of measurement, or irregular dimensions. Thus, it may be preferable to use a LinguisticObject to represent the dimensions instead as done below.

```json
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": " https://www.nga.gov/collection/art-object-page.objectid.html",
    "type": "HumanMadeObject",
    "_label": "title",
    "referred_to_by": [
        {
            "type": "LinguisticObject",
            "classified_as": [
                {
                    "id": "http://vocab.getty.edu/aat/300435430",
                    "type": "Type",
                    "_label": "Dimension Statement",
                    "classified_as": [
                        {
                            "id": "http://vocab.getty.edu/aat/300418049",
                            "type": "Type",
                            "_label": "Brief Text"
                        }
                    ]
                }
            ],
            "content": "dimensions"
        }
    ]
}
```

For example, *Ginevra de' Benci* has the following measurements in its dimensions field:

> *"overall (original panel only): 38.1 x 37 cm (15 x 14 9/16 in.)*
> *overall (thickness of original panel): 1.1 cm (7/16 in.)*
> *overall (with addition at bottom edge): 42.7 x 37 cm (16 13/16 x 14 9/16 in.)*
> *overall (thickness of addition at bottom edge): 1.9 cm (3/4 in.)*
> *framed: 59.7 x 57.8 x 3.8 cm (23 1/2 x 22 3/4 x 1 1/2 in.)"*

These measurements can be all combined into the dimension statement. Note that line breaks must be escaped with \n as JSON does not allow for line breaks in strings:

> *"overall (original panel only): 38.1 x 37 cm (15 x 14 9/16 in.)\noverall (thickness of original panel): 1.1 cm (7/16 in.)\noverall (with addition at bottom edge): 42.7 x 37 cm (16 13/16 x 14 9/16 in.)\noverall (thickness of addition at bottom edge): 1.9 cm (3/4 in.)\nframed: 59.7 x 57.8 x 3.8 cm (23 1/2 x 22 3/4 x 1 1/2 in.)"*

```
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": " https://www.nga.gov/collection/art-object-page.50724.html",
    "type": "HumanMadeObject",
    "_label": "Ginevra de' Benci [obverse]",
    "referred_to_by": [
        {
            "type": "LinguisticObject",
            "classified_as": [
                {
                    "id": "http://vocab.getty.edu/aat/300435430",
                    "type": "Type",
                    "_label": "Dimension Statement",
                    "classified_as": [
                        {
                            "id": "http://vocab.getty.edu/aat/300418049",
                            "type": "Type",
                            "_label": "Brief Text"
                        }
                    ]
                }
            ],
            "content": "overall (original panel only): 38.1 x 37 cm (15 x 14 9/16 in.)\noverall (thi
ckness of original panel): 1.1 cm (7/16 in.)\noverall (with addition at bottom edge): 42.7 x 37 cm
 (16 13/16 x 14 9/16 in.)\noverall (thickness of addition at bottom edge): 1.9 cm (3/4 in.)\nframe
d: 59.7 x 57.8 x 3.8 cm (23 1/2 x 22 3/4 x 1 1/2 in.)"
        }
    ]
}
```

Materials

The medium field in **objects.csv** can be used to describe what materials were used to create the work.

```
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": " https://www.nga.gov/collection/art-object-page.objectid.html",
    "type": "HumanMadeObject",
    "_label": "title",
    "made_of": [
        {
            "id": "http://vocab.getty.edu/...",
            "type": "Material",
            "_label": "medium"
        }
    ]
}
```

Materials can be tricky when the medium listed in **objects.csv** refers to multiple materials. One option is to list each material separately. *Ginevra de' Benci*, which has a medium of "oil on canvas," can be represented as:

```json
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": "https://www.nga.gov/collection/art-object-page.50724.html",
    "type": "HumanMadeObject",
    "_label": "Ginevra de' Benci [obverse]",
    "made_of": [
        {
            "id": "http://vocab.getty.edu/aat/300015050",
            "type": "Material",
            "_label": "oil paint"
        },
        {
            "id": "http://vocab.getty.edu/aat/300014078",
            "type": "Material",
            "_label": "canvas"
        }
    ]
}
```

Another option for handling multiple materials is to again use a LinguisticObject to formulate a materials statement.

```json
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": "https://www.nga.gov/collection/art-object-page.50724.html",
    "type": "HumanMadeObject",
    "_label": "Ginevra de' Benci [obverse]",
    "referred_to_by": [
        {
            "type": "LinguisticObject",
            "classified_as": [
                {
                    "id": "http://vocab.getty.edu/aat/300435429",
                    "type": "Type",
                    "_label": "Material Statement",
                    "classified_as": [
                        {
                            "id": "http://vocab.getty.edu/aat/300418049",
                            "type": "Type",
                            "_label": "Brief Text"
                        }
                    ]
                }
            ],
            "content": "oil on canvas"
        }
    ]
}
```

Ownership

With the assumption that all objects in **objects.csv** are owned by the NGA, it is straightforward to represent ownership for any given work:

```json
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": " https://www.nga.gov/collection/art-object-page.objectid.html",
    "type": "HumanMadeObject",
    "_label": "title",
    "current_owner": [
        {
            "id": "http://vocab.getty.edu/ulan/500115983",
            "type": "Group",
            "_label": "National Gallery of Art",
            "classified_as": [
                {
                    "id": "http://vocab.getty.edu/aat/300312281",
                    "type": "Type",
                    "_label": "Museum"
                }
            ]
        }
    ]
}
```

This does not change between works. So for Ginevra:

```json
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": "https://www.nga.gov/collection/art-object-page.50724.html",
    "type": "HumanMadeObject",
    "_label": "Ginevra de' Benci [obverse]",
    "current_owner": [
        {
            "id": "http://vocab.getty.edu/ulan/500115983",
            "type": "Group",
            "_label": "National Gallery of Art",
            "classified_as": [
                {
                    "id": "http://vocab.getty.edu/aat/300312281",
                    "type": "Type",
                    "_label": "Museum"
                }
            ]
        }
    ]
}
```

The department that oversees the work can also be specified using the departmentabbr field in **objects.csv**

```json
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": " https://www.nga.gov/collection/art-object-page.objectid.html",
    "type": "HumanMadeObject",
    "_label": "title",
    "current_custodian": [
        {
            "type": "Group",
            "_label": "departmentabbr",
            "classified_as": [
                {
                    "id": "http://vocab.getty.edu/aat/300263534",
                    "type": "Type",
                    "_label": "Department"
                }
            ]
        }
    ]
}
```

With *Ginevra de' Benci*, this looks like:

```json
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": "https://www.nga.gov/collection/art-object-page.50724.html",
    "type": "HumanMadeObject",
    "_label": "Ginevra de' Benci [obverse]",
    "current_custodian": [
        {
            "type": "Group",
            "_label": "CIS-R",
            "classified_as": [
                {
                    "id": "http://vocab.getty.edu/aat/300263534",
                    "type": "Type",
                    "_label": "Department"
                }
            ]
        }
    ]
}
```

Credit Line

The creditline field in **objects.csv** can be used to create a credit statement as a LinguisticObject:

```
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": " https://www.nga.gov/collection/art-object-page.objectid.html",
    "type": "HumanMadeObject",
    "_label": "title",
    "referred_to_by": [
        {
            "type": "LinguisticObject",
            "classified_as": [
              {
                "id": "http://vocab.getty.edu/aat/300026687",
                "type": "Type",
                "_label": "Credit Statement",
                "classified_as": [
                  {
                     "id": "http://vocab.getty.edu/aat/300418049",
                     "type": "Type",
                     "_label": "Brief Text"
                  }
                ]
              }
            ],
            "content": "creditline"
        }
    ]
}
```

For *Ginevra de' Benci*, this looks like:

```
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": "https://www.nga.gov/collection/art-object-page.50724.html",
    "type": "HumanMadeObject",
    "_label": "Ginevra de' Benci [obverse]",
    "referred_to_by": [
        {
            "type": "LinguisticObject",
            "classified_as": [
              {
                "id": "http://vocab.getty.edu/aat/300026687",
                "type": "Type",
                "_label": "Credit Statement",
                "classified_as": [
                  {
                     "id": "http://vocab.getty.edu/aat/300418049",
                     "type": "Type",
                     "_label": "Brief Text"
                  }
                ]
```

```
            }
        ],
        "content": "Ailsa Mellon Bruce Fund"
    }
  ]
}
```

Inscriptions

Any written text that adorns the object can be recorded as a Linguistic Object in the "carries" field. Note that this field is a list, so multiple inscriptions can be recorded separately.

```
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": " https://www.nga.gov/collection/art-object-page.objectid.html",
    "type": "HumanMadeObject",
    "_label": "title",
    "carries": [
      {
        "type": "LinguisticObject",
        "classified_as": [
          {
            "id": "http://vocab.getty.edu/aat/300435414",
            "type": "Type",
            "_label": "Inscription Description",
            "classified_as": [
              {
                "id": "http://vocab.getty.edu/aat/300418049",
                "type": "Type",
                "_label": "Brief Text"
              }
            ]
          }
        ],
        "content": "inscription"
      }
    ]
}
```

An example using Degas' *Four Dancers*:

```
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": "https://www.nga.gov/collection/art-object-page.46597.html",
    "type": "HumanMadeObject",
    "_label": "Four Dancers",
    "carries": [
      {
        "type": "LinguisticObject",
        "classified_as": [
          {
```

```
            "id": "http://vocab.getty.edu/aat/300435414",
            "type": "Type",
            "_label": "Inscription Description",
            "classified_as": [
              {
                "id": "http://vocab.getty.edu/aat/300418049",
                "type": "Type",
                "_label": "Brief Text"
              }
            ]
          }
        ],
        "content": "lower right with atelier stamp: Degas"
      }
    ]
}
```

Watermarks and Markings

Watermarks may be treated similarly as Linguistic Objects.

```
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": " https://www.nga.gov/collection/art-object-page.objectid.html",
    "type": "HumanMadeObject",
    "_label": "title",
    "referred_to_by": [
      {
        "type": "LinguisticObject",
        "classified_as": [
          {
            "id": "http://vocab.getty.edu/aat/300435421",
            "type": "Type",
            "_label": "Watermarks Description",
            "classified_as": [
              {
                "id": "http://vocab.getty.edu/aat/300418049",
                "type": "Type",
                "_label": "Brief Text"
              }
            ]
          }
        ],
        "content": "watermarks"
      }
    ]
}
```

Below is an example using a charcoal drawing by Georgia O'Keefe:

```json
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": "https://www.nga.gov/collection/art-object-page.56659.html",
    "type": "HumanMadeObject",
    "_label": "The Shell",
    "referred_to_by": [
      {
        "type": "LinguisticObject",
        "classified_as": [
          {
            "id": "http://vocab.getty.edu/aat/300435421",
            "type": "Type",
            "_label": "Watermarks Description",
            "classified_as": [
              {
                "id": "http://vocab.getty.edu/aat/300418049",
                "type": "Type",
                "_label": "Brief Text"
              }
            ]
          }
        ],
        "content": "MBM (FRANCE) INGRES d/'Arches"
      }
    ]
}
```

Markings are treated very similarly:

```json
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": " https://www.nga.gov/collection/art-object-page.objectid.html",
    "type": "HumanMadeObject",
    "_label": "title",
    "referred_to_by": [

      {
        "type": "LinguisticObject",
        "classified_as": [
          {
            "id": "http://vocab.getty.edu/aat/300435420",
            "type": "Type",
            "_label": "Mark Description",
            "classified_as": [
              {
                "id": "http://vocab.getty.edu/aat/300418049",
                "type": "Type",
                "_label": "Brief Text"
              }
            ]
```

```
          }
      ],
        "content": "markings"
    }
  ]


}
```

Below is an example using an etching by Edgar Degas:

```
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": "https://www.nga.gov/collection/art-object-page.6481.html",
    "type": "HumanMadeObject",
    "_label": "Dancers in the Wings",
    "referred_to_by": [
      {
        "type": "LinguisticObject",
        "classified_as": [
          {
            "id": "http://vocab.getty.edu/aat/300435420",
            "type": "Type",
            "_label": "Mark Description",
            "classified_as": [
              {
                "id": "http://vocab.getty.edu/aat/300418049",
                "type": "Type",
                "_label": "Brief Text"
              }
            ]
          }
        ],
        "content": "Degas\'s studio stamp"
      }
    ]
}
```

locations.csv

Now that we have exhausted a majority of the fields in **objects.csv**, these basic representations can be supplemented with related data from other data files in the repository. The only reference to location in **objects.csv** is the locationid field, which is only present for objects currently on display. This field is the primary key in **locations.csv**, which contains the room codes and location descriptions, which can be used to populate the location information as demonstrated below:

```
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": " https://www.nga.gov/collection/art-object-p
C:\Users\Work\Documents\Linked_Art\example_ginevra.jsonage.objectid.html",
    "type": "HumanMadeObject",
    "_label": "title",
    "current_location": {

      "type": "Place",
      "_label": "locations(locationid).description"

    }
}
```

The syntax `locations(locationid).description` means to find the entry in **locations.csv** with the locationid corresponding to the object and take the value in the description field.

For example, *Ginevra de' Benci* has a locaionid of 9017 listed in **objects.csv**. In **locations.csv**, the locationid of 9017 corresponds to the description "West Main Floor Gallery 6".

```
{
    "@context": "https://linked.art/ns/v1/linked-art.json",
    "id": "https://www.nga.gov/collection/art-object-page.50724.html",
    "type": "HumanMadeObject",
    "_label": "Ginevra de' Benci [obverse]",
    "current_location": {

      "type": "Place",
      "_label": "West Main Floor Gallery 6"

    }
}
```

A more comprehensive way to represent the location involves using more fields from **locations.csv**, such as the room, site, and unit position. The location can then be described beginning with the highest level of granularity and the "part_of" relationship can be used to move to less granular descriptions. In other words, the current location is first described by the unit position which is said to be a "part of" a room, which is "part of" a particular site, which is "part of" the National Gallery of Art campus. The description can also be included as a Linguistic Object.

```
{
  "@context": "https://linked.art/ns/v1/linked-art.json",
  "id": "https://www.nga.gov/collection/art-object-page.objectid.html",
  "type": "HumanMadeObject",
  "_label": "title",
  "current_location": {
    "type": "Place",
```

```json
        "_label": "locations(locationid).unitposition",
        "classified_as": [
          {
              "id": "http://vocab.getty.edu/aat/300430649",
              "type": "Type",
              "_label": "Position Indicator"
          }
        ],
        "part_of": [
          {
            "type": "Place",
            "_label": "locations(locationid).room",
            "classified_as": [
              {
                "id": "http://vocab.getty.edu/aat/300240057",
                "type": "Type",
                "_label": "Galleries (Display Spaces)"
              }
            ],
            "referred_to_by": [
              {
                "type": "LinguisticObject",
                "classified_as": [
                  {
                    "id": "http://vocab.getty.edu/aat/300435449",
                    "type": "Type",
                    "_label": "Current Location Statement",
                    "classified_as": [
                      {
                        "id": "http://vocab.getty.edu/aat/300418049",
                        "type": "Type",
                        "_label": "Brief Text"
                      }
                    ]
                  }
                ],
                "content": "locations(locationid).description"
              }
            ],



            "part_of": [
              {
                "type": "Place",
                "_label": "locations(locationid).site",
                "classified_as": [
                  {
```

```
                "id": "http://vocab.getty.edu/aat/300005232",
                "type": "Type",
                "_label": "Art Galleries (Buildings)"
              }
            ],
             "part_of": [

              {
                "type": "Place",
                "_label": "National Gallery of Art",
                "classified_as": [
                  {
                    "id": "http://vocab.getty.edu/aat/300264847",
                    "type": "Type",
                    "_label": "Art Museums (Buildings)"
                  }
                ]
              }
            ]
          }
        ]
      }
    ]
  }
}
```

Ginevra de' Benci is in the center unit position of room M-006 in the West Building. This would be represented as:

```
{
  "@context": "https://linked.art/ns/v1/linked-art.json",
  "id": "https://www.nga.gov/collection/art-object-page.50724.html",
  "type": "HumanMadeObject",
  "_label": "Ginevra de' Benci [obverse]",
  "current_location": {
    "type": "Place",
    "_label": "CENTER",
    "classified_as": [
      {
          "id": "http://vocab.getty.edu/aat/300430649",
          "type": "Type",
          "_label": "Position Indicator"
      }
    ],
    "part_of": [
      {
        "type": "Place",
        "_label": "M-006",
        "classified_as": [
          {
```

```
      "id": "http://vocab.getty.edu/aat/300240057",
      "type": "Type",
      "_label": "Galleries (Display Spaces)"
    }
  ],
  "referred_to_by": [
    {
      "type": "LinguisticObject",
      "classified_as": [
        {
          "id": "http://vocab.getty.edu/aat/300435449",
          "type": "Type",
          "_label": "Current Location Statement",
          "classified_as": [
            {
              "id": "http://vocab.getty.edu/aat/300418049",
              "type": "Type",
              "_label": "Brief Text"
            }
          ]
        }
      ],
      "content": "West Main Floor Gallery 6"
    }
  ],
  "part_of": [
    {
      "type": "Place",
      "_label": "West Building",
      "classified_as": [
        {
          "id": "http://vocab.getty.edu/aat/300005232",
          "type": "Type",
          "_label": "Art Galleries (Buildings)"
        }
      ],
      "part_of": [
        {
          "type": "Place",
          "_label": "National Gallery of Art",
          "classified_as": [
            {
              "id": "http://vocab.getty.edu/aat/300264847",
              "type": "Type",
              "_label": "Art Museums (Buildings)"
            }
          ]
        }
      ]
    }
```

```
        ]
      }
    ]
  }
}
```

object_associations.csv

Some objects are considered to parents of other objects. While **objects.csv** contains a parentid field, which contains the objectid of the parent object (if there is one), this is less useful when there is a parent and one wants to know if it has children. The **object_associations.csv** file associates the object id of the parent with its children. In Linked Art, the child object can be represented as a "part", which is an embedded Human-Made Object.

```
{
  "@context": "https://linked.art/ns/v1/linked-art.json",
  "id": "https://www.nga.gov/collection/art-object-page.objectid.html",
  "type": "HumanMadeObject",
  "_label": "title",
  "part": [
    {
      "id": "https://www.nga.gov/collection/art-object-
page.object_associations(objectid).childobjectid.html",
      "type": "HumanMadeObject",
      "_label": "objects(object_associations(objectid).childobjectid).title"
    }
  ]
}
```

For example, looking up *Ginevra de' Benci's* objectid of 50724 in the parentobjectid field of **object_associations.csv** yields an inseparable child object with id 50725. Going back to **objects.csv** and searching for objectid 50725 yields the back of the work, *Wreath of Laurel, Palm, and Juniper with a Scroll inscribed Virtutem Forma Decorat [reverse]*.

```
{
  "@context": "https://linked.art/ns/v1/linked-art.json",
  "id": "https://www.nga.gov/collection/art-object-page.50724.html",
  "type": "HumanMadeObject",
  "_label": "Ginevra de' Benci [obverse]",
  "part": [
    {
      "id": "https://www.nga.gov/collection/art-object-page.50725.html",
      "type": "HumanMadeObject",
      "_label": "Wreath of Laurel, Palm, and Juniper with a Scroll inscribed Virtutem Forma Decora
t [reverse]"
    }
  ]
}
```

objects_altnums.csv

This table maps objectid numbers to any other identification numbers they may go by. For many, this is an Old Accession Number, which can be represented as follows:

```json
{
  "@context": "https://linked.art/ns/v1/linked-art.json",
  "id": "https://www.nga.gov/collection/art-object-page.objectid.html",
  "type": "HumanMadeObject",
  "_label": "title",
  "identified_by": [
    {
      "type": "Identifier",
      "classified_as": [
        {
          "id": "http://vocab.getty.edu/aat/300404626",
          "type": "Type",
          "_label": "Identification Numbers"
        },
        {
          "id": "http://vocab.getty.edu/aat/300404908",
          "type": "Type",
          "_label": "Obsolete"
        }
      ],
      "content": "object_altnums(objectid).altnum"
    }
  ]
}
```

With *Ginevra de' Benci*, looking up the objectid of 50724 in **objects_altnums.csv** yields an Old Access Number of 2326:

```json
{
  "@context": "https://linked.art/ns/v1/linked-art.json",
  "id": "https://www.nga.gov/collection/art-object-page.50724.html",
  "type": "HumanMadeObject",
  "_label": "Ginevra de' Benci [obverse]",
  "identified_by": [
    {
      "type": "Identifier",
      "classified_as": [
        {
          "id": "http://vocab.getty.edu/aat/300404626",
          "type": "Type",
          "_label": "Identification Numbers"
        },
        {
          "id": "http://vocab.getty.edu/aat/300404908",
          "type": "Type",
          "_label": "Obsolete"
        }
```

```
        ],
        "content": "2326"
    }
  ]
}
```

objects_constituents.csv and constituents.csv

The various constituents associated with any given object can be obtained by looking up the objectid for the object in **objects_constituents.csv**. This will give the constituentid of the constituent, who's name can then be looked up in **constituents.csv**.

For example, looking up *Ginevra de' Benci's* objectid of 50724 in **objects_constituents.csv** yields 3 constituents, 2 of which are donors and 1 of which is the artist. Taking their 3 constituentids of 193, 1479, and 8547 and looking them up in **constituents.csv** allows their identities to be obtained. The artist's information can be used to supplement the "carried_out_by" field of the production information as done below:

```
{
  "@context": "https://linked.art/ns/v1/linked-art.json",
  "id": "https://www.nga.gov/collection/art-object-page.50724.html",
  "type": "HumanMadeObject",
  "_label": "Ginevra de' Benci [obverse]",
  "produced_by": {
      "type": "Production",
      "timespan": {
        "type": "TimeSpan",
        "begin_of_the_begin": "1474-01-01T00:00:00Z",
        "end_of_the_end": "1478-01-01T00:00:00Z"
      },
      "carried_out_by": [
          {
              "id": "http://vocab.getty.edu/ulan/500010879",
              "type": "Person",
              "_label": "Leonardo da Vinci",
              "identified_by": [
                {
                  "type": "Identifier",
                  "classified_as": [
                    {
                      "id": "http://vocab.getty.edu/aat/300404621",
                      "type": "Type",
                      "_label": "Owner-Assigned Number"
                    }
                  ],
                  "content": "1479"
                }
              ],
              "classified_as": [
                {
                  "id": "http://vocab.getty.edu/aat/300111198",
                  "type": "Type",
```

```json
              "_label": "Italian",
              "classified_as": [
                {
                  "id": "http://vocab.getty.edu/aat/300379842",
                  "type": "Type",
                  "_label": "Nationality"
                }
              ]
            }
          ],
          "born": {
            "type": "Birth",
            "timespan": {
              "type": "TimeSpan",
              "begin_of_the_begin": "1452"
            }
          },
          "died": {
            "type": "Death",
            "timespan": {
              "type": "TimeSpan",
              "end_of_the_end": "1519"
            }
          }
        }
      ]
    }
}
```