Short Introduction to the FAIR data principles

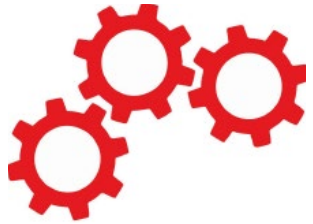
What is FAIR data

Findable 

It should be possible for others to discover your data.

Accessible 

It should be possible for humans and machines to gain access to your data.

Interoperable 

It should be possible to combine and exchange data from different sources.

Reusable 

Data should be sufficiently documented to support their interpretation and reuse.

Wilkinson, M. *et al. The FAIR Guiding Principles for scientific data management and stewardship. Sci Data* **3**, 160018 (2016). https://doi.org/10.1038/sdata.2016.18

The issue of non-findable data

Knowledge cannot be obtained from data that you cannot locate.

Duplicate experiments that some else has performed.

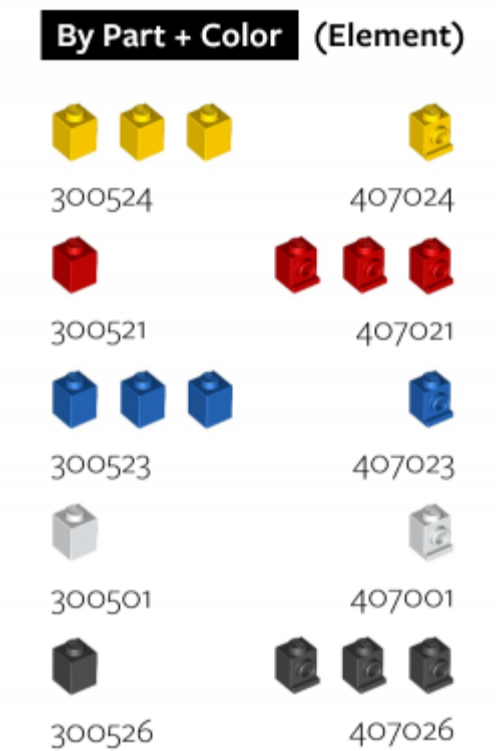
Searching for data results in a waste of time and effort.

Missed chance for interdisciplinary discoveries.

Photo by Xavi Cabrera on Unsplash

Making data findable

F1: (Meta)data are assigned a globally unique and persistent identifier

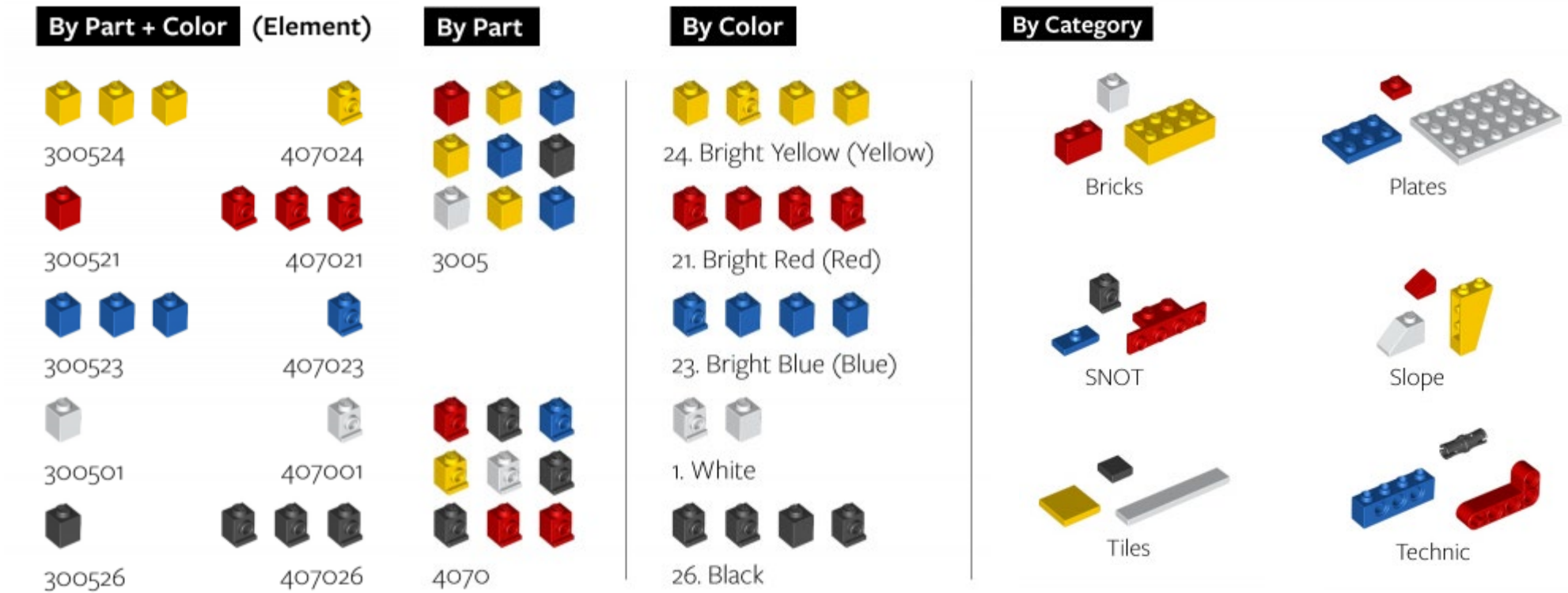


https://brickarchitect.com/

Making data findable

F1: (Meta)data are assigned a globally unique and persistent identifier

F2: Data are described with rich metadata



https://brickarchitect.com/

The issue with non-accessible data

To use the data you find, you need to get your hands on it.

Detailed metadata cannot be obtained with restricted access.

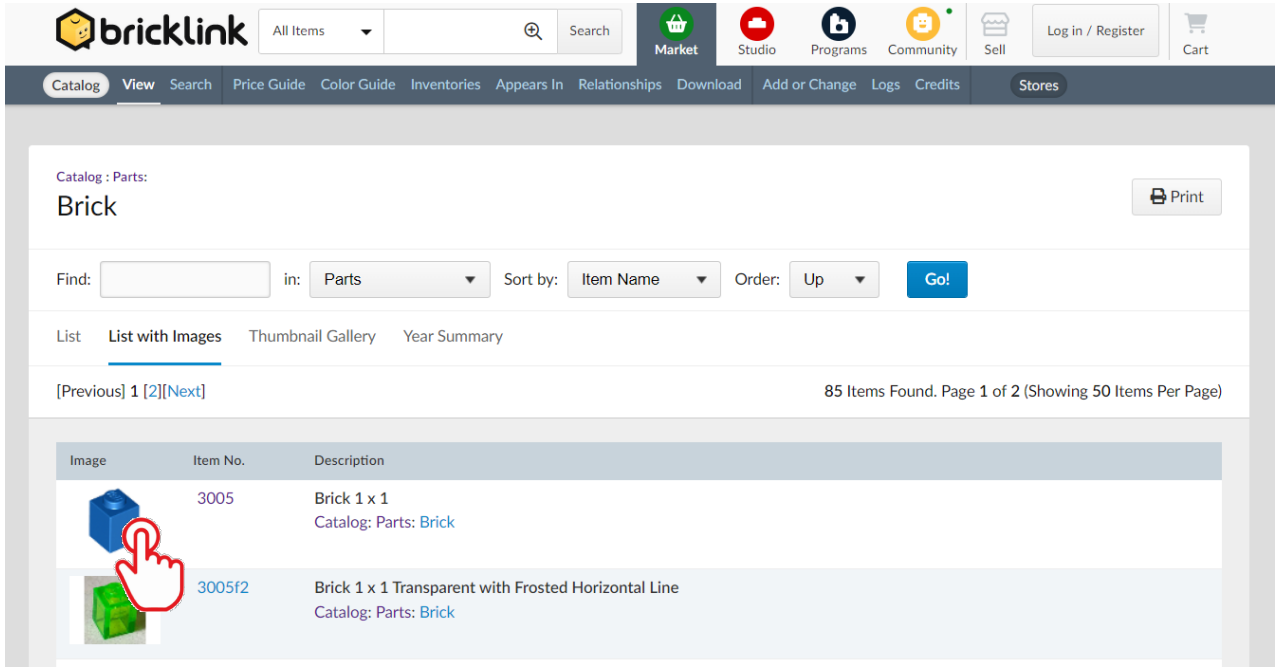
Lack of clear access rules lead to long time to acquire the data.

Inability to reproduce and verify data.

Accessibility

A1: (Meta)data are retrievable by their identifier using a standardized communication protocol

What is a communication protocol?
A set of rules and standards that allow for exchange of data between two or more entities in a consistent and predictable manner.
For example: hypertext transfer protocol (HTTP).



https://www.bricklink.com

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https://www.bricklink.com

The issue with non-interoperable data

Data are stored formats that require specialized tools to use.

Impossible to compare data from different sources.

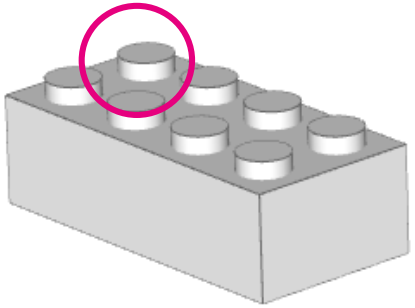
Different labels exist to describe the same quantities.

Data are structured differently by different researchers.

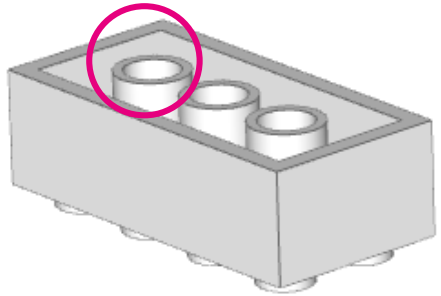
Photo by Carlos Móner, Bricks on Display

Making data interoperable

I1: (Meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation



- Protrusion
- Cylinder
- Post
- Stud

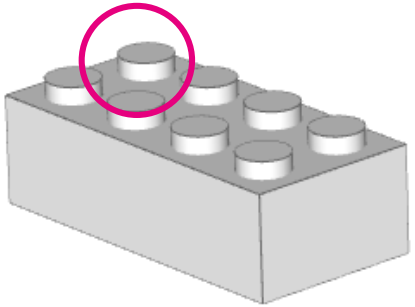


- Hole
- Hollow cylinder
- Tunnel
- Tube

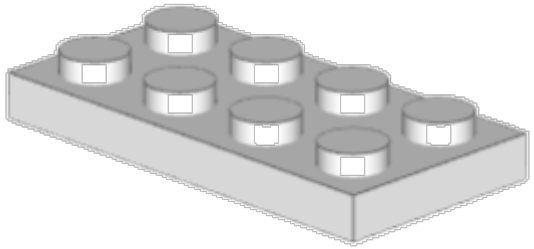
https://swooshable.com

Making data interoperable

I1: (Meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation

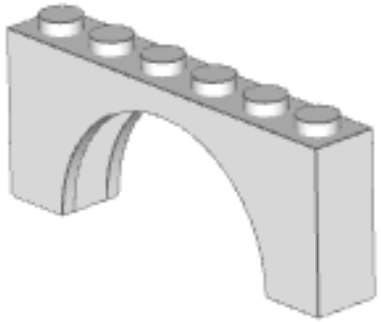


This is a **brick** with 8 studs

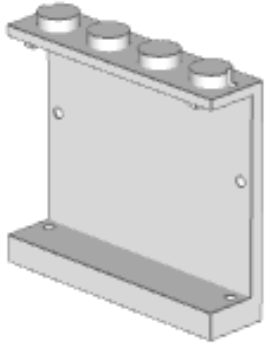


This is a **plate** with 8 studs

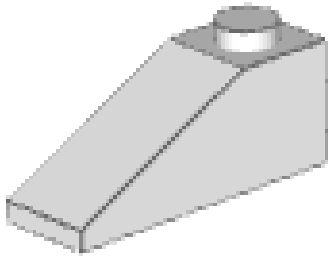
Tile



Arch



Panel



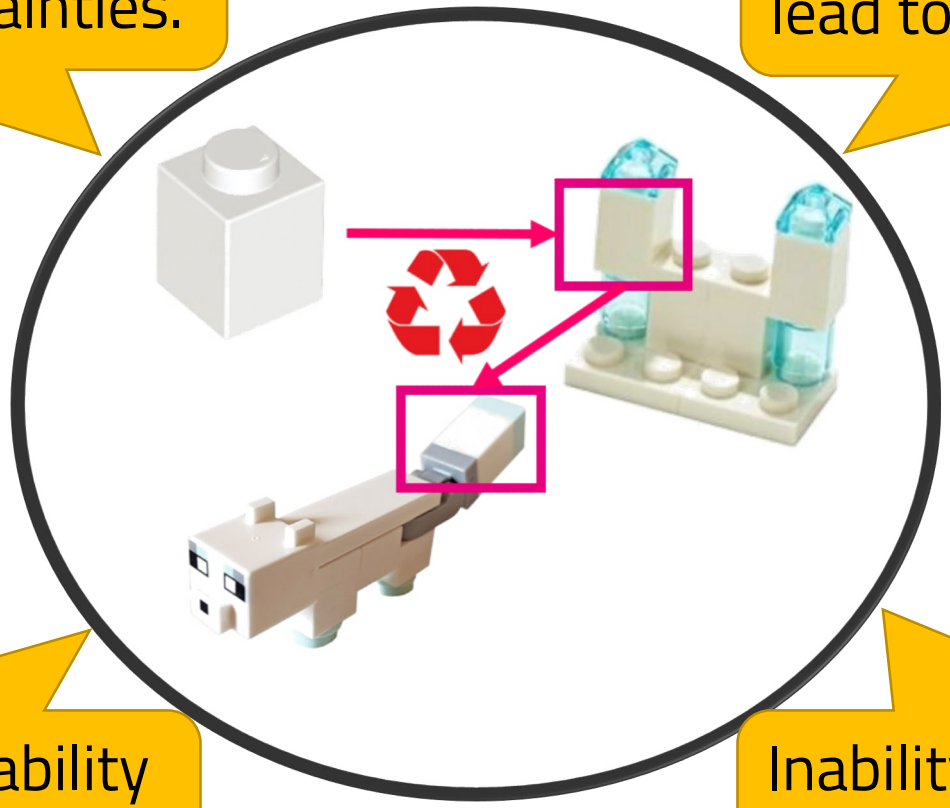
Slope

https://swooshable.com

Issues associated with data reusability

Absence of a clear license for data reuse leads to uncertainties.

The lack of digitized metadata lead to misinterpretation.



Inability to assess the suitability of data for the planned reuse.

Inability to define who should be credited, cited, or contacted.

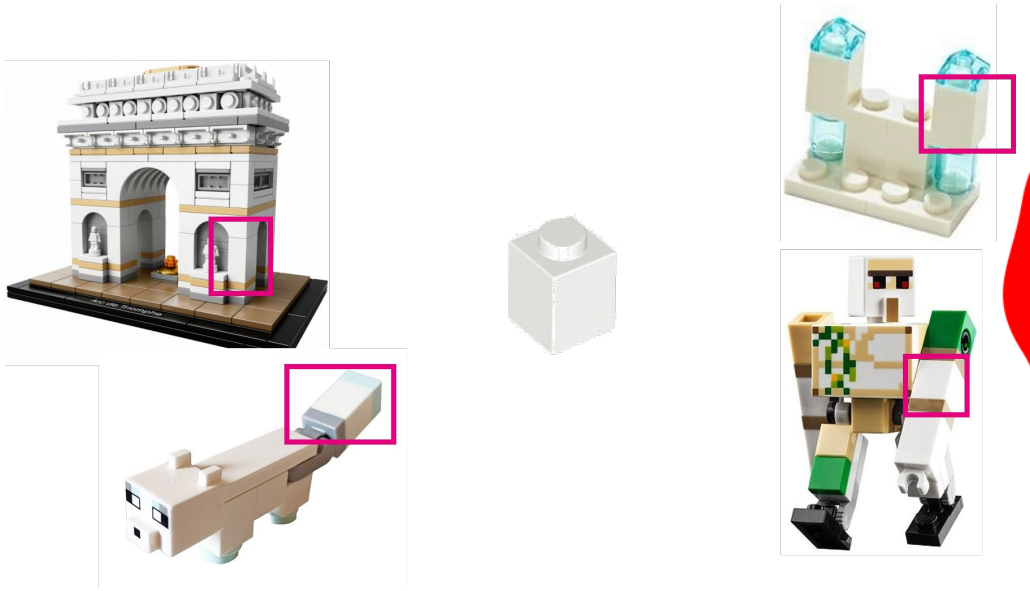
Making data reusable

R1: (meta)data are richly described with a plurality of accurate and relevant attributes

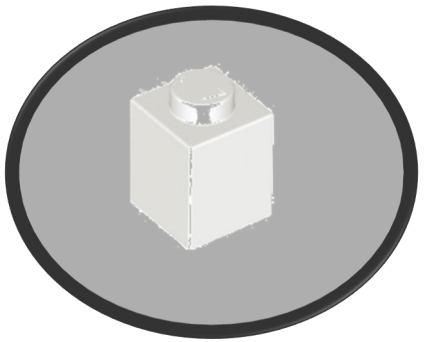
Both the metadata and data should be described in a manner that enables assessment of the resource in a certain study.

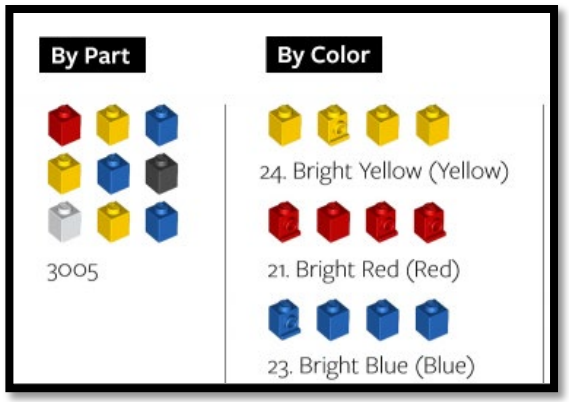
Plurality

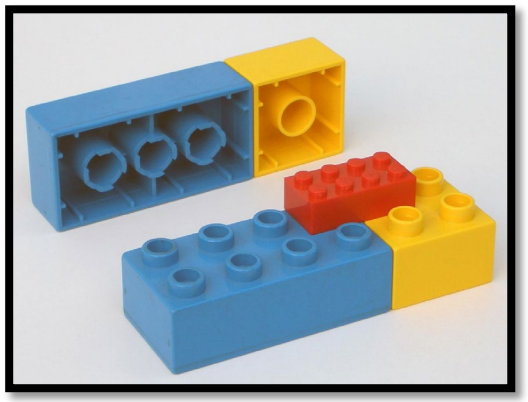
- Make no assumption on who the user of your data may be
- Be as generous as possible with the provided metadata
- Metadata should support a variety of possible use cases for you data



Summary




By Part
By Color
3005
24. Bright Yellow (Yellow)
21. Bright Red (Red)
23. Bright Blue (Blue)



Learn more:

Full Tutorial on YouTube:

All Slides on Zenodo: